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ABSTRACT

This five-volume report presents detailed procedures and findings of research on Japanese high school seniors, their choice of courses, educational and career expectations and preferences, and the extent to which these attitudes conform to relationships in Japanese labor markets. In an analysis of the transition from secondary school to college or the labor market, this third volume concentrates on the educational decision without a detailed analysis of career choice and job markets. The five volumes are available as VT 013 653-013 657. (BH)

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A THEORETICAL AND EMPIRICAL ANALYSIS OF VOCATIONAL PREPARATION IN JAPAN

Volume III of five volumes

To Higher Education or to the Labor Market

December, 1970

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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To Higher Education or to the Labor Market.

Project Grant No. OEG-3-6-000537-0744
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Mary Jean Bowman
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December, 1970

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CHAPTER IV

THE COLLEGE OPTIONS IN AN ECONOMIC DECISION MODEL

The transition from upper secondary school to higher education or to the labor market is important everywhere. It has become of growing importance in Japan as the proportions of on-coming cohorts moving through the upper secondary schools have first passed the 50 percent mark and now crowd four-fifths, with talk of making universal education to this level compulsory in the future. How many and which of these youth will go directly onto the labor market, how many and which will pursue their education further, and in what ways? Japan has long since passed the stage at which upper secondary schooling was for an elite. And that country, despite the system of "first schools," has never suffered from what might be called the "hanging vine" syndrome so common in Europe, where even to the present day a typical concern is that current cohorts of secondary-school graduates might not find university "places." In this respect, at least, Japan is more like the United States, even as, like us, that nation is also moving toward an expansion and differentiation of junior colleges within higher education. But Japan is also distinctive in its ronin system and the factors that explain the growth of that system and its persistence. Before going on with development of a decision model for Stage II analysis, it will be useful to step back and look at just where the

students flowing out of Japanese upper secondary schools are and have been going. We concentrate in this chapter on a preliminary analysis of the education decision in particular, leaving more detailed examination of job markets, occupational expectation patterns and anticipated post-school career paths for Chapters V and VI.

I. Destinations and Transition Processes at Graduation from Upper Secondary Schools: an Overview

Of the 930,000 youth, male and female, who came out of Japanese full-time general secondary schools in 1968, 36 percent entered one or another institution of higher education. Another 18 percent (a full half as many) became ronin, attending special tutorials and cram courses and studying for another year to take examinations once again in the hope of gaining entry to preferred institutions of higher education (or, in some cases, to any such institution). Only two-fifths of the graduates of general upper secondary schools took up full-time employment. The proportions continuing with their schooling as indicated in these figures (from Table 4-1) are the more impressive when we remember that they include women as well as men, and students from General A as well as General B curricula.

In the same year, of 1968, another 555,000 young people graduated from upper-secondary vocational courses. The bulk of these youth went directly onto the labor market, and they accounted for 58 percent of the new labor-market entrants from upper secondary school. One of every fourteen

TABLE 4-1

ANALYSIS OF DESTINATIONS OF 1968 GRADUATES OF FULL-TIME UPPER-SECONDARY SCHOOLS

PART A. PERCENTAGE DISTRIBUTIONS AMONG MAJOR DESTINATION CATEGORIES

Schools of Origin	Number of Graduates (thousands)	Destinations				
		Total	To Higher Education	Ronin	To Labor Market	Other
General Schools: All	930	100	36.0	17.9	38.1	8.0
National	3	100	58.9	36.2	4.5	0.4
Public	605	100	34.3	22.1	37.2	6.4
Private	323	100	39.2	9.6	40.2	11.0
Vocational Schools: All	555	100	7.3	1.9	86.8	4.0
National	1	100	13.6	1.7	84.7	...
Public	361	100	6.3	2.4	88.7	2.6
Private	193	100	9.2	1.0	83.1	6.7
All Students	1,485	100	25.3	11.9	56.4	6.4

PART B. PERCENTAGE DISTRIBUTIONS AMONG TYPES OF HIGHER INSTITUTIONS

	All Higher Institutions	Day University			Day Jr. College	Night Courses
		Nat'l	Public	Private		
General Schools						
National	100	50	4	40	5	1
Public	100	21	3	48	25	3
Private	101	3	1	57	38	2
Vocational Schools	100	1	*	55	38	6
All Students	100	13	2	52	30	3

PART C. PERCENTAGE DISTRIBUTIONS AMONG ORIGINS

	All Higher Institutions	Day University			Day Jr. College	Night Courses	Ronin
		Nat'l	Public	Private			
General Schools							
National	1	2	1	*	*	*	1
Public	55	89	86	53	45	56	90
Private	34	8	11	36	41	22	2
Vocational Schools	11	1	2	11	13	23	7
All Students	101	100	100	100	99	101	100

Source: Computed from data in MEJ 6736, pages 5, 7, and 8.

*Under 0.5 percent.

vocational graduates entered institutions of higher education and two percent became rōnin.

Most of the young people in this flood of new upper-secondary-school graduates came out of the public institutions, which, taking males and females together, accounted for two thirds of both the general-course students and the "vocational" students. The public schools accounted for more than two-thirds of the male upper-secondary graduates; the private secondary schools have the larger female representations in their student bodies. Despite their high visibility, the national general and vocational schools together accounted for only four thousand of the million and a half upper-secondary graduates. Almost all of the graduates of the national general schools either went on to university (59 percent) or became rōnin (36 percent). Both because of their sex composition and their orientation to private institutions of higher education, the private upper-secondary schools produced fewer rōnin; they had the largest proportions entering junior colleges (mainly girls) and in the "other" category of Table 4-1 (also mainly girls).

The distribution of destinations of youth going on to higher education are shown by schools of origin in the second tier of Table 4-1. The predominant quantitative place of the private universities, noted in Chapter II, is immediately evident. Private universities account for over half of all students going directly into institutions of higher education and for more than three-fourths of those going directly to day universities. Destinations

among vocational-school graduates entering institutions of higher education are very like those from private general secondary schools in the large fractions entering private universities and junior colleges, where entry examinations are usually less demanding than in the national universities--although there are also some intellectually elite universities. Night schools claimed only a tiny fraction of each group except the graduates of vocational curricula, 6 percent of whom entered such courses. The combination of economic pressure and achievement orientations among these night-school youth is unmistakable, but so are the problems they face later in competition in the premium job markets with those who follow more conventional and prestigious routes.

Finally, in the third tier of Table 4-1 we see how large a share graduates of the public upper-secondary schools constitute within each destination category. Nowhere are graduates of the national general secondary schools more than 1 percent of the total, and the public general-school graduates account for 90 percent of the rōnin. Graduates of the vocational secondary schools account for a larger proportion of night school students (23 percent) than of any other destination group--excepting, of course, direct entry to the labor market.

Against this background, we are now ready to turn to two important aspects of the situation with respect to the transition to higher education in Japan: (1) relationships between higher education preferences and

realizations, with special reference to the rōnin system, and (2) the extent to which Japanese youth in post-secondary day and night education were also holding jobs.

Preferences, Destinations, and the Rōnin Phenomenon

Some results of a 1968 study by the Ministry of Education comparing stated post-graduation preferences of upper-secondary students with their actual destinations are reproduced in Table 4-2. Three important features of this table are immediately evident.[1]

First, the two highest figures on the diagonals, where destination follows in line with expressed preferences, are for entry to private universities and to private junior colleges. This pattern is repeated virtually regardless of whether the secondary schools of origin were national, public or private general schools, or vocational schools.[2] This fact is an extremely important feature of the Japanese system, especially when one considers the very large differences in costs to the individual entering private as against national or public institutions, along with the quantitative importance

---

[1] Again we are unable to seperate the sexes, but we do know that women predominate in the junior college preferences and destinations and in the last, "other," column.

[2] There is one exception; the proportion in the diagonal cell for youth from national general upper-secondary schools seeking entry to national or public junior colleges is higher (71 percent realization) than that in the diagonal cell for students from national secondary schools who expressed and realized a preference for a private university. The private university column aside, values in the diagonal cells are consistently higher for youth from the national general schools than for any others.

of the private colleges and universities. It means that discussions in Japan about the presumed inequity of the tuition differentials run up against the hard fact that to remove that "inequity" by subsidizing the private institutions, in an attempt to imitiate European or Latin American models, could be very expensive indeed. Yet the other alternative, of raising tuition in the national and public institutions while providing scholarship assistance across the board, has apparently not been considered at all. Neither, to our knowledge has there as yet been any discussion of the possibilities of some sort of voucher system, whether along Swedish lines or in comparison with other proposals that have been circulating recently in England and the United States.

Second, and closely related to the preceding remarks, the rōnin proportions are extremely high among those expressing preference for a national or public university. This pattern is evident, if less extreme, even among graduates of the national general secondary schools, who have the largest proportions successful in realizing their preferences without spending time as rōnin. Vocational-school youth who manage to enter national or public universities without first being rōnin, or even after a year as rōnin, are exceptional indeed; even among the exceptional few who have seriously entertained such ambitions only 9 percent managed to go directly into national universities. The fact remains, nevertheless, that direct entry to a national university from a vocational secondary school is not entirely precluded.

TABLE 4-2

POST-GRADUATION PREFERENCES AND REALIZATIONS OF 1968 GRADUATES OF FULL-TIME UPPER SECONDARY SCHOOLS

Type of Upper Secondary (All Full-time)		Preferred Type of Higher Institution	Distribution of Preferred Types: No. of Students (thous.)	Distribution of Preferred Types: % of Students	Distribution of Actual Destinations: Total	University: Nat'l	University: Pub.	University: Priv.	Jr. Coll.: Nat'l Pub.	Jr. Coll.: Priv.	Night School: Univ.	Night School: Jr. C.	Ronin	Seeking Empl.	Other
General:	All														
		Day: National University	169,900	18.2	100.0	27.7	1.4	9.0	0.8	1.4	0.3	0.2	47.6	5.2	6.4
		Day: Public University	33,800	3.6	100.0	3.6	13.0	14.9	1.2	2.8	0.5	0.2	51.3	4.3	8.2
		Day: Private University	245,200	26.4	100.0	0.2	0.1	61.6	0.1	2.9	1.0	0.1	25.4	3.3	5.3
	N = (930,000)	Day: National, Public Jr. Coll.	16,300	1.8	100.0	0.8	0.1	1.5	24.1	15.4	0.1	0.4	10.3	14.4	32.9
		Day: Private Jr. Coll.	93,500	10.1	100.0	0.0	--	0.7	0.1	84.7	0.0	0.2	2.0	3.0	9.3
		Night: University	6,000	.6	100.0	0.3	0.1	2.5	0.1	0.2	42.7	0.8	12.2	33.5	7.6
		Night: Junior College	2,300	.2	100.0	--	--	0.4	1.1	5.1	0.4	59.7	4.6	18.1	10.6
		None	363,000	39.0											
	National														
		Day: National University	1,900	59.4	100.0	43.8	1.2	11.5	0.3	0.3	--	--	42.4	0.3	0.2
		Day: Public University	200	6.2	100.0	12.7	24.1	17.7	--	1.9	--	--	41.7	--	1.9
		Day: Private University	700	21.9	100.0	2.8	0.7	64.6	--	3.7	1.2	--	27.0	--	--
	N = (3,200)	Day: National, Public Jr. Coll.	21	.7	100.0	--	--	--	71.4	14.3	--	--	14.3	--	--
		Day: Private Jr. Coll.	46	1.4	100.0	--	--	--	--	93.5	--	--	--	--	6.5
		Night: University	6	.2	100.0	--	--	--	--	--	(50.0)	--	--	(50.0)	--
		Night: Junior College	--	--	--	--	--	--	--	--	--	--	--	--	--
		None	327	10.2											
	Public														
		Day: National University	148,700	24.5	100.0	28.4	1.4	8.9	0.9	1.4	0.3	0.2	46.8	5.7	6.4
		Day: Public University	28,800	4.8	100.0	3.9	13.2	14.5	1.3	2.5	0.6	0.2	51.8	4.9	7.1
		Day: Private University	147,700	24.4	100.0	0.3	0.1	55.6	0.2	3.0	1.1	0.1	30.6	4.1	4.9
	N = (605,000)	Day: National, Public Jr. Coll.	13,900	2.3	100.0	0.9	0.1	1.5	25.5	15.4	0.1	0.5	10.7	15.8	29.5
		Day: Private Jr. Coll.	44,100	7.3	100.0	0.0	--	0.7	0.2	83.3	0.0	0.2	3.3	3.7	8.6
		Night: University	4,600	.8	100.0	0.5	0.1	1.7	0.2	0.2	41.3	0.4	11.5	38.1	6.0
		Night: Junior College	1,700	.3	100.0	--	--	0.5	0.8	4.0	0.5	58.8	4.2	19.3	11.9
		None	215,500	35.6											
	Private														
		Day: National University	19,200	5.9	100.0	21.3	1.2	12.4	0.4	1.6	0.2	0.2	53.7	2.0	7.0
		Day: Public University	4,900	1.5	100.0	1.4	11.3	17.4	0.4	4.7	0.1	0.1	48.4	1.0	15.2
		Day: Private University	96,900	30.0	100.0	0.0	0.0	70.4	0.1	2.9	1.0	0.1	17.4	2.1	6.0
	N = (323,000)	Day: National, Public Jr. Coll.	2,400	0.7	100.0	--	--	1.7	15.8	15.6	--	0.3	8.2	6.0	52.4
		Day: Private Jr. Coll.	49,400	15.3	100.0	0.0	--	0.7	0.0	86.0	0.0	0.2	0.8	2.4	9.9
		Night: University	1,400	0.4	100.0	--	--	5.2	--	0.4	47.0	2.0	14.3	18.3	12.8
		Night: Junior College	600	0.2	100.0	--	--	--	1.9	8.1	--	62.4	5.6	14.8	7.2
		None	148,200	45.9											
Vocational															
		Day: National University	4,100	0.7	100.0	8.8	0.8	6.3	0.4	1.4	1.1	0.6	60.0	12.0	8.6
		Day: Public University	1,400	0.3	100.0	0.6	10.0	6.0	0.3	1.1	0.9	0.3	60.1	16.5	4.2
		Day: Private University	31,900	5.7	100.0	0.2	--	67.3	0.2	1.7	1.7	0.1	19.1	6.6	3.1
	N = (555,000)	Day: National, Public Jr. Coll.	1,600	0.3	100.0	0.2	--	1.8	26.2	8.2	0.2	--	14.2	21.8	27.4
		Day: Private Jr. Coll.	15,900	2.9	100.0	--	--	0.5	--	86.2	--	0.2	1.2	2.6	9.3
		Night: University	2,600	0.5	100.0	--	--	2.4	--	0.5	36.8	0.8	5.2	53.1	1.2
		Night: Junior College	1,300	0.2	100.0	--	--	0.3	--	2.5	--	49.5	4.5	38.6	4.5
		None	496,200	89.4											

Source: MEJ 6736, pp. 7-8.

Third, it is notable that among those who expressed a preference for either night university or night junior college the important off-diagonal entries are employment or seeking employment. This pattern is repeated for each of the categories in schools of origin (barring national upper-secondary schools, with too few cases expressing such preferences). It is strongest among the vocational graduates and weakest, as we should by now expect, among youth who had attended private upper-secondary schools. Nevertheless, we find rōnin even among young people who had expressed a preference for night courses in higher education.

Another look at the rōnin, this time in relation to academic performance, is provided in Table 4-3. Turning first to the last two columns, we see that in each row of the table the mean examination scores for rōnin are lower than those for direct entrants, though some of the differences are small and they virtually disappear when the means are taken for all graduates of each category of general secondary school rather than for preference sub-groups within the secondary school categories. Equally interesting, for each category on school of origin the mean grades of rōnin aiming at entry to national universities are higher than mean scores of direct entrants to private institutions of higher education. The lowest mean score and the largest proportions with extremely low scores are for rōnin from national upper-secondary schools seeking entry to private institutions of higher education; this phenomenon is easily understood, as are most of the other distribution data in the middle of Table 4-3.

TABLE 4-3

RONIN PROPORTIONS AMONG UPPER-SECONDARY GRADUATES AND THEIR GRADE DISTRIBUTIONS BY TYPES OF CONTROL OF SECONDARY SCHOOLS AND UNIVERSITY ASPIRATIONS, 1968

Category of Upper Secondary School	Type of University Sought or Chosen	Percent Ronin	Percentages of Ronin With Grade Average				Ronin Mean Grade Average	Mean Grade Average of Direct Entrants
			Under 3.0	Under 3.5	Above 4.0	Above 4.5		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
National Upper Secondary	National	42	14	42	33	10	3.7	4.1
	Public	42	26	68	12	-	3.3	3.8
	Private	30	53	90	3	-	3.0	3.4
Public Upper Secondary	National	47	13	50	21	5	3.5	4.0
	Public	52	20	64	10	1	3.4	3.8
	Private	31	41	83	3	*	3.1	3.3
Private Upper Secondary	National	54	7	29	40	13	3.8	4.3
	Public	48	10	38	27	4	3.6	4.1
	Private	17	27	66	11	2	3.3	3.4
National Upper Secondary	All	39	21	52	27	8	3.6	3.8
Public Upper Secondary	All	40	24	63	13	3	3.4	3.5
Private Upper Secondary	All	24	19	51	23	6	3.5	3.5

*Under 0.5 percent.

Source: Computed from data provided in MEJ 6736, page 45.

Another way of looking at the transition from upper-secondary school to higher education or to the universities in particular is to reverse perspective, asking not what the secondary graduates do immediately after graduation but rather what routes have been followed by those who ultimately enter institutions of higher education. As of 1959, three-fifths of the students enrolled in day universities had entered directly from secondary schools, just over a third (36 percent) had been rōnin, and 4 percent had been in regular employment.[1] Over the decade of the 1960's the rōnin proportions among successful applicants to universities declined somewhat; 31 percent of the successful applicants in 1967 had been rōnin. In medicine and dentistry the rōnin proportions constituted 50 percent, and among males entering junior colleges a surprising 40 percent were rōnin.[2] The 31 percent figure matches quite closely the rōnin proportions among youth who had just graduated from upper-secondary schools in 1968 and who were seeking post-secondary education--implied by the data of Table 4-1. The overall 11.9 percent of all new graduates who became rōnin in 1968 constituted a third of the combined figure for youth entering universities or colleges directly and those who became rōnin. It does not follow that all rōnin will gain their

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[1] Among the small group attending night universities, the proportions were very different; two-fifths had entered directly from secondary schools, two-fifths after a period of regular employment without post-secondary schooling, and one-fifth had been rōnin. (These figures are taken from the special study of higher education in 1959, published by the Ministry of Education in 1961.)

[2] Japan: Central Council for Education (1969), p. 30.

objectives a year later, however. If we take the experience of the upper-secondary graduates of 1963 through 1965 as indicative, roughly two-thirds may make it after the first rōnin year and another fifth of the original rōnin will persist and enter a higher institution of some sort after a second year as rōnin.[1] A few continue on and on, with only occasional light employment.

Work among Day and Night Students in Colleges and Universities

It is reasonable to suppose a priori that students attending night universities or night junior colleges hold jobs at the same time, whereas youth attending day institutions usually do not work or work much less. The special 1959 survey of students in institutions of higher education supports this proposition (see Table 4-4).

TABLE 4-4

PROPORTIONS OF WORKING STUDENTS AND THEIR EARNINGS: DAY AND NIGHT UNIVERSITIES BY TYPE OF CONTROL, 1959

Type of Control of Higher Institution	Percentages of Students Engaged in Regular or Spare-time Work		Average Annual Earnings of Working Students (Yen)	
	Night Students	Day Students	Night Students	Day Students
National	73.2	63.0	148,800	22,200
Public	74.0	50.2	135,000	22,300
Private	63.5	33.8	137,600	24,600

Source: MEJ, 1961, p. 62.

[1] Estimates from the 1968 survey as reported in Japan, Central Council for Education, 1969, p. 29.

The striking contrast is between the amounts earned by night and day students who worked to support themselves or to supplement their incomes. Regardless of the type of the agency of control of the higher institution, day students who worked earned on the average between 22 and 25 thousand yen, or roughly $61 to $68 a year. This is spare-time or vacation period work, and the figures for proportions working must be interpreted accordingly. Taking all college and university students together, including those attending night schools, the proportions of new entrants reporting regular relatively full work programs has run around 5 to 7 percent over the past decade. By arbitrarily assuming that all students attending night school were working, we get a minimum estimate that approximately 3 or 4 percent of the day students held more or less regular jobs; attributing all the regular working students to the day institutions we get a maximum estimate, definitely too high, at 6-7 percent for day students. Few of those who were regularly working were girls, and comparatively few girls reported even limited spare-time or vacation employment while attending college or university.

In fact in 1959 roughly two-thirds of the night school students in institutions of higher education were holding regular jobs--a somewhat smaller fraction in the private, a somewhat larger fraction in the national and public institutions. But those who reported working spent many hours on their jobs. This is evident from the monetary earnings data. The working students in national night schools averaged the equivalent of roughly $410 a

year, those in public and in private night schools averaged around $370 and $385 a year. While these sums look small to an American college youth--and, for that matter, to many Japanese college youth as well--it must be remembered that the Japanese college students have developed much more efficient and economical consumption patterns and also, of critical importance, the yen figures understate the real earnings of those in regular employment. Such employees typically receive important fringe benefits, which may include housing or at the least hostel subsidies, in addition to their reported monetary receipts. The majority of working night-school students were fully or largely self supporting, even if at very low levels.[1]

II. A Stage II Decision Model for Higher Education

As the Japanese youth approaches the transition from upper secondary school to labor market, institution of higher education, or a rōnin interval, he is facing a crucial choice already anticipated in varying measure at least three years earlier, when he entered upper-secondary school. Whatever the determinants of and constraints on that earlier choice, it conditions the nature of the options now available. At the same time, the family and environmental

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[1] So far as the Table 4-4 data on proportions reporting work are concerned, the chief contrasts within the night or within the day school categories seem to reflect, in part at least, the sex mix; relatively more females attend the private than the public or national day institutions. From these data it is impossible to determine whether family income effects are also important in reducing the proportions of those in the private (and more costly) institutions who work to support themselves in greater or lesser degree.

background conditions that shaped the earlier perceptions and influences are still at play. But this is not all. The student has meanwhile grown three critical years older, his perceptions of educational and occupational career options have almost certainly become both more discriminative and also objectively more diversified. This diversification of perceived possible options will occur even if he has come to focus more definitely on a particular goal and excludes more options on strictly preference grounds. (It is also possible that with enlarged horizons he could have become more uncertain rather then more definite about career anticipations.) Meanwhile, the kind of school he has attended, the courses he has taken and the characteristics of his class-room peers will have contributed to the shaping and reshaping, the strengthening or weakening, of his orientations toward higher education in general and alternatives within higher education in particular.

These common-sense generalizations can advantageously be systematized by use of a formal construct similar to the one we introduced at the end of Chapter III. This time, however, we are laying out the model early in our analysis, and will use it as a reference framework in subsequent discussions of empirical evidence relating to "the higher education decision." We use this last limiting phrase deliberately, since most of the empirical analysis that follows in this chapter is concerned with the simple distinction between taking or not taking examinations for college or university. However, we first present the model in a generalized form that includes choices (and constraints on choices)

among various types of higher education. The decision to become a rōnin is of course a derived choice, taken up only as it may be a necessary condition for entry to the preferred institution, or to any higher education at all; in other words, the rōnin option is part of a higher-education entry cost.

A General Formulation

Following the mode of presentation used earlier, we may again set up an optimization problem, using a quasi-certainty model. Initially we will set this up in two parts.

The first problem is to choose the higher education alternative z that will maximize the individual's expected net utility U_{zi} among post-secondary alternatives, subject to the constraint introduced before, that $A_i \geq Z_a$ where A_i is again individual ability and Z_a is an ability cut-off level for entry to higher education option z. This was in fact a sub-optimization problem in the Stage I decision model as well, except that the point from which expectations and preferences were taken and to which their "present values" were related was the upper-secondary school entry point instead of the transition out of upper-secondary schools to further education or employment. We may now add another constraint which was implicit in the earlier model as well; the option z will be excluded if the particular actual past upper-secondary experience of the individual was one that absolutely precludes acceptance in z. In the notation used earlier, some options kz may be excluded by exclusive conditions of

entry into z from certain upper-secondary schools or curricula. With a slight modification of the earlier format we may now write a simple summation of utility functions:

$$(1) \qquad U_{zi} = U_{zj}(J_{zi}) + U_{zy}(Y_{zi}) - U_{zc}(C_{zi}) + \Pi_{zi}$$

In this equation Π_{zi} represents satisfactions associated with choice of z but unrelated to expected earnings or to satisfactions associated with anticipated careers. Further, again in part paralleling the presentation in Chapter III, we may write:

$$(2) \qquad J_{zi} = J_z(A_i, F_i, M_i, I_i, G_{zjki})$$

$$(3) \qquad Y_{zi} = Y_z(A_i, F_i, M_i, G_{zyki})$$

$$(4) \qquad C_{zi} = C_z(D_z, L_{zi}, E_{zi}, W_i)$$

The important differences between these generalized functions and those presented in Decision Stage I are that the expectations (and the utility evaluations of them) are in the perspective of Stage II, at completion of upper-secondary school; and that the effects of intervening experiences are included, in the new terms G_{zjki} and G_{zyki}. The first of these, G_{zjki}, refers to the effects of the intervening experiences in option k on perceived occupational or job-career profiles and preferences, income considerations aside. The term G_{zyki} refers to effects of intervening experiences in option k on perceived future income profiles associated with higher education z. Subsequently we will

distinguish between two major aspects of k as it operates through G_{zjki} and G_{zyki}; the curriculum effect, which we designate as S_k or simply S, and the classroom composition or peers effect, which we designate as H_k or simply H.[1]

It must be evident that E_{zi}, the cost of gaining entry to a particular option in higher education, will depend upon an individual's success on examinations and on whether a year or more as a rōnin will be needed. But this will depend both on the individual's ability A_i and on how well his upper-secondary experience S_k prepared him for examinations. The chance that he may not succeed even after heavy investments as a rōnin is also pragmatically important, though we have not specified such probabilities in the model.

Letting U^*_{zi} represent the maximal value for U_{zi} among the various z options, we may then turn to the second half of our problem, which is to specify the optimal choice among non-college alternatives. Using the subscript t to denote alternatives with upper-secondary schooling as terminal, we may write:

(5) $U_{ti} = U_{tj}(J_{ti}) + U_{ty}(Y_{ti})$ where

(6) $J_{ti} = J_t(A_i, F_i, M_i, I_i, S_{ki})$

(7) $Y_{ti} = Y_t(A_i, F_i, M_i, S_{ki})$

Designating the maximum value of U_{ti} by U^*_{ti} and defining $U_{zti} = U^*_{zi} - U^*_{ti}$

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[1] Note that actual prospects as well as perceptions may have been affected by S_k and H even controlling for z, but only present constraints and expectations for the future enter directly into a decision.

it is then evident that where $U_{zti} > 0$ the college option is the optimum optimorum, whereas where $U_{zti} < 0$ the best choice will exclude college. This is of course tautological, but by setting it out in this way we are now in a position to take another step toward operationalizing the model and specifying empirically observable variables. Assuming cardinal utilities, as we have been doing all along, and designating with a prime the particular z and the t options that maximized U_{zi} and U_{ti} we may then write:

$$(8) \quad U_{zti} = [U'_{zy}(Y_{zi}) - U'_{ty}(Y_{ti})] + [U'_{zj}(J_{zi}) - U'_{tj}(J_{ti})] - U'_{zc}(C_{zi}) + \epsilon_{zi}$$

First Steps toward Operationalization of the Model

Certain reasonable empirical assumptions can be made about these utility functions and their relationships. First of all, it seems reasonable enough to suppose that, other things equal, most people will prefer bigger to smaller future earnings, and both U_{zy} and U_{ty} will be positive monotonic functions of anticipated earnings for any given date (earnings for all other dates held constant). This same rather weak assumption allows us to specify that the larger the difference $(Y_{zi} - Y_{ti})$ anticipated for any given date, the more attractive will be the college as against the non-college option. Later on in this chapter we will introduce some direct observations on "peak-year" income anticipations for university and non-university men as those two prospects are perceived and compared by the college-oriented and the non-college graduates

of the upper-secondary schools. We will introduce also a preliminary statistical analysis of other determinants of those earnings expectations. More detailed examination of perceived future life-earnings profiles, and of how such profiles compare with constructions from published age cross-section data on earnings, is deferred to another chapter, however.

The second bracketed term of (8) is more problematic; even if we had a full matrix of job-preference-opportunity perceptions, there is no obviously legitimate basis for translating such information into a form that would allow us to "add it up." What we will in fact do is to use expressions of selected dimensions of job preferences regardless of higher education along with observations on variables such as those specified in the model equations (2) and (6) to stand in for $[U'_{zj}(J_{zi}) - U'_{tj}(J_{ti})]$ in regression equations in which the dichotomy taking or not taking examinations is the dependent (likelihood) variable. The most important job dimensions for the present purpose are the student's aspired or expected ultimate occupational status, his preferred kind of employment situation, and special family-linked career options (F_i of our models), all of which are taken after the implicit net optimizing decision with its z or its t implications. Other background characteristics such as parental education undoubtedly affect job perceptions, but unfortunately they operate also relatively directly on the most elusive term in the model, Π_{zi}.

The cost factor C_{zi} is tidy enough in principle, though somewhat elusive in practice. The 1968 study by the Ministry of Education enables us to relate

parental education and parental occupation to type of higher institution attended, but it is difficult with those data to distinguish among the various ways in which parental backgrounds come into play and how far they relate to the economics of the decision. There, as with some of the analysis of our own data, we are relying on parental occupation as a stand-in for family economic level W_i, which in turn is an indirect way of specifying financial liquidity and interest costs. However, we have parental income data for employee and for self-employed (and family-enterprise) fathers, which give us some direct indicators for W_i that can be used in some of the analysis. While we have no direct measures of E_{zi}, we do have the students' statements on the matter of willingness to be rōnin if necessary to attain their goals. And we have locational measures, discussed earlier, that provide adequate indicators of L_{zi}. Taken together, the pieces for getting a picture of C_{zi} and its place in the college versus non-college decision are reasonably satisfactory, despite limitations on the possibilities of fitting them together in tidy arithmetic fashion.

Most of the ensuing discussion uses either cross-tabulations or open sets of multiple-regression equations for the analysis of factors in the Stage II decision. A careful study of those results convinced us that further elaboration in more elegant closed econometric models still using observations on individuals would not make additions to our substantive understanding commensurate with the costs of the additional work. However, we will add some simultaneous and reduced-form equations using populations of entire schools instead of individuals as the units of observation.

III. Socio-Economic Backgrounds and Occupational Expectations as Determinants of Likelihoods of Continuing into Higher Education

Even if we set aside the confounding direct consumption component Π_{zi} in demands for higher education, interpretations of statistical associations between parental education or occupation and rates of college attendance (or active hope of going to college) in terms of investment decisions are confounded because these background variables operate in at least two distinct ways--on perceived sets of career options J_{zi} and J_{ti} and the utilities attached to those options on the one hand, and on C_{zi} through ability to finance schooling on the other. Help in sorting out some of these effects will come cumulatively from several directions, with the analysis of various aspects of the data collected in our samples. For a start, however, it will be useful to sort out parental characteristics of students entering various types of higher institutions as reported in the study by the Japanese Ministry of Education for 1968.

Parental Backgrounds of Graduates Entering Colleges and Labor Markets in 1968

On purely economic grounds we might expect a priori the following ordering in relative representation of the lowest economic status groups in post-graduation destinations (exclusive of rōnin):

(1) Directly to the labor market, especially among youth who live in locations inaccessible to night courses.

(2) Night courses

(3) National and public junior colleges and universities

(4) Private junior colleges and universities

The reasons for this a priori ordering, which disregards possible associations between either preferences or achievements on tests and parental backgrounds, are simple enough. The first two options, directly to the labor market and to night school, take priority among the economically disadvantaged because of the importance of foregone earnings and the constraints on financing higher education wherever it is not feasible to earn all or a major part of one's living expenses. Private institutions would have the smallest representation because of their much higher tuition and fees. Poor youth unable to gain entry to the national or public institutions will be less likely to find a place in higher education at all. Only if the low status youth among upper-secondary graduates were disproportionately low in performance on examinations, and to a significant degree, could we expect the counteractive effects of ability constraints to neutralize the effects of financial constraints on relative representations in public and private day institutions. In fact the data of Table 4-5 validate the a priori economic ordering. This is readily seen by looking across the rows for sons of men with compulsory schooling only, for sons of men in agriculture, and for sons of laborers. The big jumps, as we should expect, are between direct entry to the labor market and night school, and then (excepting farmers' sons)[1] between night and day colleges and universities regardless of control.

[1] This exception reflects the fact that night programs in higher institutions are not usually accessible to rural residents.

TABLE 4-5

RELATIONSHIPS BETWEEN PARENTAL BACKGROUNDS AND DESTINATIONS OF GRADUATES OF FULL-TIME SENIOR SECONDARY COURSES, 1968

	Directly to Labor Market	To College or University (Full-time)	Day University (Full-time)			Day Junior College Full-time		Night Full-time University or Jr. Coll.
			National	Public	Private	National, Public	Private	
Total Numbers	836,500	376,000	49,500	7,100	195,000	6,800	107,200	10,400
			Percentage Distributions					
Father's Education								
1. College or University	3.9	26.4	27.6	25.6	27.3	21.1	25.7	12.5
2. Middle	27.8	39.5	34.4	38.3	39.5	37.7	42.8	33.4
3. Compulsory Years	59.3	29.0	31.8	31.0	28.4	36.0	26.7	45.6
4. Other and N.R. (incl. one or both parents deceased	9.0	5.1	6.2	5.1	4.8	5.2	4.8	8.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Father's Occupation								
1. Agriculture and Related	31.2	12.1	14.3	10.5	10.5	17.7	13.0	20.2
2. Civil Servants	11.1	21.8	26.9	23.4	20.7	24.8	21.9	14.6
3. White-collar Employees, Private Firms	23.5	27.9	29.9	32.5	28.6	29.7	25.7	25.4
4. Managers and Proprietors	10.0	21.2	11.9	15.0	23.4	11.7	22.9	17.5
5. Shopkeepers, Artisans, Skilled and Semi-skilled Manual	11.4	9.2	8.3	9.6	9.1	8.2	9.6	11.0
6. Self-employed	1.6	3.3	2.5	3.5	3.7	2.5	3.2	2.1
7. Laborers	7.2	1.8	2.8	2.7	1.6	2.5	1.3	4.6
8. Other	4.0	2.7	3.4	2.8	2.4	2.9	2.4	4.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from data in MEJ 6736, pp. 27 and 29. Data were not shown separately by sex.

By contrast, sons of university men are rare among those entering the labor market and they are decidedly under-represented among entrants to night courses in higher education.

Another feature of the occupation distributions is worth special notice: sons and daughters of managers and proprietors are decidedly over-represented in the private universities and colleges relative to their representation elsewhere. This unquestionably is associated with differences in perceived career options and preferences that stem from family environments--the I_i and F_i factors of our models are clearly operative here, both as a sociological or communication phenomenon and in more narrowly economic terms.

Parental Education and the Two Decision Points

With Table 4-6 we focus on the more limited question of taking examinations or not, regardless of the type of institution the youth hope to enter or of their success in doing so. However, these data (from our samples) allow us to treat males separately and to distinguish among types of vocational curricula in a two-stage matrix. Table 4-6 answers the questions: (1) What are the likelihoods (if he goes to upper-secondary school at all)[1] that the son of a man with each of the designated amounts of schooling will enroll

[1] Or, more precisely, if he goes to any of the five specified curricula. These are almost but not quite all-inclusive with respect to full-time upper-secondary schools for males.

TABLE 4-6

PARENTAL BACKGROUNDS, COURSE TYPE AND EXAMINATIONS FOR ENTRANCE TO INSTITUTIONS OF HIGHER EDUCATION AMONG MALE UPPER-SECONDARY GRADUATES, 1966

	Father's Level of Education				All Cases
	Compulsory Years	Middle (Secondary)	Higher (Junior College)	University	
Percentage in General B	30.5	50.0	65.2	77.2	41.1
Percentage of General B to College or University	84.7	93.2	96.3	99.0	90.4
Percentage in General A	14.6	10.2	7.1	3.2	12.4
Percentage of General A to College or University	4.5	15.9	30.0	62.5	9.8
Percentage in Agricultural Course	9.6	7.1	3.4	0.4	8.1
Percentage of Agricultural to College or University	6.9	14.4	15.2	--	9.1
Percentage in Commercial Course	19.8	12.9	8.4	5.1	15.6
Percentage of Commercial to College or University	14.1	20.7	35.0	35.3	17.5
Percentage in Technical Course	25.5	19.8	15.9	14.2	22.9
Percentage of Technical to College or University	9.4	18.0	25.7	26.4	13.6
Total Percentages Taking Exam.					
In General B	25.8	46.6	62.8	76.4	37.2
In General A	0.7	1.6	2.1	2.0	1.2
In Agric. Course	0.7	1.0	0.5	--	0.7
In Commerce Course	2.8	2.7	3.0	1.8	2.7
In Technical Course	2.4	3.6	4.1	3.7	3.1
Total	32.4	55.5	72.5	83.9	44.9
Total Percentages Not Taking Exam.					
In General B	4.7	3.4	2.4	0.8	3.9
In General A	13.9	8.6	4.9	1.2	11.2
In Agric. Course	9.0	6.0	2.9	0.4	7.4
In Commerce Courses	17.0	10.2	5.5	3.1	12.9
In Technical Course	23.1	16.3	11.8	10.4	19.8
Total	67.7	44.5	27.5	15.9	55.2

in each of the five curricula? (2) If he enrolls in any curriculum S_k, what is the likelihood that a youth whose father had, say, middle school education will take examinations for college or university? (3) When we multiply these probability matrices, how do we come out on the likelihoods that the son of a man with middle schooling (and so on) will follow each sequential education path--such, for example, as to a commerce curriculum in upper-secondary school and thereafter to college or university?

It must be evident from the start that the results shown in a tabulation such as we have presented here must be picking up several things at once. We are observing the more or less direct effects of parental education on perceived career options and preferences in association with educational expectations (operating on J_{zi} and J_{ti} through I_i). We are observing also the influence of parental education on valuation of more immediate consumer returns to education (Π_{zi}). And we are also picking up more indirect economic influences of other characteristics with which parental education is associated--in particular, accessibility costs (through L_{zi} via rurality) and ability-to-pay or interest costs (through W_i). But if these associations are in some respects diffuse, the patterns are nevertheless clear and plausible.

The first-stage patterns are familiar enough from Chapter III. There is a strong positive monotonic relationship between level of parental education and enrollment in the General B curriculum, whereas the relationships are negative for all other courses, but especially for the agricultural course and for

General A. Once a youth has enrolled in a General B curriculum, the likelihood that he will try for higher education is extremely great; even among General B youth from the least educated homes almost 85 percent took examinations for entry to higher institutions. In no other curriculum did so many sons even of university graduates attempt the examinations. Though effects of parental education operated in the directions we might expect within each of the various courses, the major within-course impact was the dramatic one for General A students. It is among the General A students of the least educated parents that we find the lowest college-going rates, at only 4.5 percent taking examinations, of any cell in the upper part of Table 4-6. Yet of General A youth whose fathers had been through universities, over three-fifths (62.5 percent) took examinations. This fact alone strongly argues that among many General A students there has been a deferral of the college (or non-college) decision, that college-going options have remained viable, and that the direct and indirect effects of parental example and suasion continue to operate to bring youth from educationally advantaged homes into accord with family expectations. In no other curriculum alternative do we observe a comparable effect.

Overall, the highest frequency cells in the lower half of Table 4-6 are those for General B college-directed youth; entries in that row are the highest, regardless of parental education. The next highest cell frequencies are for non-college youth of humble backgrounds attending courses other than General

B and for technical-school youth entering the labor market (regardless of father's schooling). Despite the importance of the technical graduates among entrants to the labor market, it is notable also that next to General B these schools provided the largest share of college-oriented youth among sons of fathers in all except the compulsory schooling categories.

In sum, it seems evident that parental education relates to college-going plans and behavior both at Stage I, with selection among courses in upper secondary school, and later on, at graduation--especially among General A students. But the most important college effect of parental background is clearly the earlier one, in the choice between General B and other upper-secondary curricula.[1] Paradoxically, perhaps it may be all the more interesting and important to look into how other measures of family and community environment and/or job preferences and expectations may discriminate between college and non-college destinations of graduates within each of the upper-secondary curricula.

College versus Non-College Youth within Course Types: a Regression Summary

Two dependent variables were used in an attempt to explain differences in college orientations among youth within each of the school curriculum

[1] It is important in this connection to remember that General B was indeed the curriculum most cited as the preferred one by students enrolled in other than their first choices of upper-secondary courses; some, in other words, who desired to take this option were unable, for one reason or another, to do so.

categories. One of these was the simple dichotomy, to which we have already made reference several times: taking or not taking an examination for college or university. The other was an elaborately constructed college-orientation index, treated as quasi-cardinal. Particularly important among the responses used in the construction of that index were those on the question concerning attitudes toward becoming a rōnin, should that be necessary in order to attain educational goals. Results of otherwise comparable regression equations were typically very similar for the two versions of the dependent variable. The chief exception was the noticeable advantage in prediction of the scaled dependent variable in those of the equations for the technical-school students that included job preference and non-family environmental variables.

The most interesting and important results of the regression analyses are of course the patterns in regression coefficients. It is helpful, nevertheless, to begin with a summary overview, provided in Table 4-7. (The independent variables included in each regression equation may be read off of the row headings on Tables 4-8 and 4-9.) For each equation Table 4-7 shows the coefficient of determination and, in parentheses, its F value. Because of the large sizes of the samples, most of these F values look quite respectable and are highly significant statistically. Fortunately also, the statistical illegitimacy of applying significance tests with a Yes/No, likelihood dependent variable fades away as sample size increases. On the other hand, the coefficients of determination are not by any means overwhelming. The

TABLE 4-7

COEFFICIENTS OF DETERMINATION AND F VALUES FOR WITHIN-COURSE-TYPE REGRESSION ANALYSES OF COLLEGE EXPECTATIONS OF MALE UPPER-SECONDARY SENIORS, 1966

Sets of Independent Variables in Equation	Type of Course				
	General B	General A	Agri-culture	Com-mercial	Technical
Number of Students	1788	542	1162	1037	2564
	Dependent Variable = Took Examinations				
Mean of Dependent Variable	.904	.098	.090	.175	.136
(1) FLEVS only	.031 (14.28)	.093 (13.73)	.012 (3.39)	.021 (5.44)	.024 (15.51)
(2) Parental Background	.086 (7.96)	.163 (4.83)	.031 (1.82)	.061 (3.17)	.049 (6.17)
(3) Parental Background, Class-room, Location	.129 (10.00)	.308 (8.85)	.082 (4.08)	.115 (5.04)	.073 (7.74)
(4) Preferred Job, EXPSTA and Expected Occup. Type	.077 (13.45)	.117 (6.37)	.055 (6.12)	.035 (3.36)	.033 (8.00)
(5) Equation (4) plus Pref. Course, Class-room, Location and Labor-market Perceptions	.178 (15.31)	.279 (8.01)	.139 (7.33)	.182 (8.98)	.157 (18.87)
(6) Full Equation; all variables in (3) and (5)	.214 (9.06)	.374 (5.64)	.167 (4.35)	.260 (6.64)	.196 (11.80)
	Dependent Variable = University Attitude-Expectation Scale				
(1)′ FLEVS	.027 (12.55)	.112 (17.00)	.014 (4.08)	.023 (5.95)	.024 (15.48)
(2)′ Parental Background	.080 (7.32)	.162 (4.81)	.031 (1.85)	.052 (2.63)	.050 (6.32)
(3)′ Parental Background, Class-room, Location	.123 (9.49)	.306 (8.74)	.102 (5.17)	.122 (5.39)	.090 (9.64)
(4)′ Preferred Job, EXPSTA and Expected Occup. Type	.068 (11.77)	.112 (6.09)	.068 (7.67)	.036 (3.48)	.044 (10.63)
(5)′ Equation (4) plus Pref. Course, Class-room, Location and Labor-market Perceptions	.174 (14.88)	.291 (8.48)	.172 (9.41)	.210 (10.75)	.207 (26.56)
(6)′ Full Equation; all variables in (3) and (5)	.208 (8.78)	.371 (5.56)	.211 (5.81)	.279 (7.31)	.259 (16.92)

biggest R^2 was .374; this was on the all-variable equation (6) for the General A student population. Generally the equations with preference and attitude variables performed better than those with background variables, but General A was a marked exception in this respect. Adding classroom composition and location-accessibility variables substantially increased the coefficients of determination and their F values in virtually all cases, and whether the starting point had been equations with parental characteristics or with sets of student preferences and expectations among their independent variables. All this is clearly evident from Table 4-7.

For a closer examination of just how the independent variables behave we must turn to Table 4-8 and 4-9, which show regression coefficients. As in the regression equations used in Chapter III, these are built up in the main from independent dummy-variable sets, and the regression coefficients constitute comparisons between a particular category in a set and the omitted category of that set. For example, the entry in the first column after FLEVS 3 tells us that, controlling for other variables in regressions (2), having a father with middle or secondary education raises the likelihood that a General B student will take examinations by 6.4 percent over the likelihood that a General B student whose father had not gone beyond 8th or 9th grade would do so. The five independent variables added in regressions (3) are treated as cardinal indicators, however; this calls for quite a different interpretation of their regression coefficients.

TABLE 4-8

WITHIN-COURSE-TYPE REGRESSION EQUATIONS FOR PROBABILITY OF TAKING ENTRY EXAMINATIONS TO INSTITUTIONS OF HIGHER EDUCATION ON PARENTAL BACKGROUND AND COMMUNITY VARIABLES; MALE UPPER-SECONDARY SENIORS, 1966

	General B		General A		Agriculture		Commerce		Technical	
N	1788	1788	543	543	1162	1162	1037	1037	2564	2564
Mean	.904	.904	.098	.098	.090	.090	.175	.175	.136	.136
Equation Number	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)
R^2	.086	.129	.163	.308	.031	.082	.061	.115	.049	.073
F	7.957	9.995	4.834	8.850	1.816	4.076	3.167	5.038	6.174	7.737
Intercept	.827***	.724***	.052	-.058	.065	.030	.187	.307	.140	.043
FLEVS 1, 2	-	-	-	-	-	-	-	-	-	-
3	.064***	.060***	.070*	.070*	.067**	.058**	.054	.059**	.063***	.052**
4	.080**	.067**	.188**	.110	.077	.065	.176**	.134**	.123***	.109**
5	.083**	.055*	.476***	.367***	-.074	-.120	.131	.059	.132**	.100*
0	.024	.022	.072	.062	.022	.019	.109*	.128**	.088***	.073***
OSTAS 1	.112*	.099*	.109	.168	.102	.103	-.363	-.302	.218	.204
2	.098**	.090**	.689***	.623***			.105	.099	.076	.062
3	.081***	.067**	.100	.113	.113	.108	.103	.113*	.046	.047
4	.027	.018	.128*	.143**	.042	.057	-.036	-.012	.002	.006
5	--	--	--	--	--	--	--	--	--	--
6	.069	.065**	.008	.020	-.012	-.005	-.101**	-.091**	-.059**	-.057**
7	.011	.017	-.008	-.003	-.019	-.001	-.034	-.026	-.033	-.029
8	-.175*	-.160*	-.050	.020	-.067	-.065	-.115	-.119	-.096*	-.069
0	.094**	.085**	.117*	.154***	.076	.096	-.034	-.042	.004	.007
EMPLOYEE	--	--	--	--	--	--	--	--	--	--
SELF 1	.049*	.052	.022	.043	.009	.013	-.016	-.003	.024	.031
SELF 2	.052*	.070	.031	.059	.138*	.119*	.023	.042	-.010	-.006
FARM 1	-.104**	-.024	-.025	.006	-.007	.011	-.133*	-.071	-.068	-.015
FARM 2	-.165***	-.084	-.049	.003	.002	.021	.082	.147*	-.040	.014
MISC	-.014	.020	-.103*	-.089*	.004	.004	.021	.040	-.019	-.012
FW - FULL	--	--	--	--	--	--	--	--	--	--
PT	-.055	-.050	-.085	-.107	.015	.001	.029	.021	-.121*	-.119*
NO	-.103*	-.095*	-.063	-.103	.013	.002	-.120	-.127*	-.085*	-.087*
DEAD	-.014	-.026	-.016	-.037	-.019	-.033	-.126**	-.125**	-.075***	-.074***
O	.017	-.031	-.198	-.205*	.070	.065	-.088	-.135	-.147*	-.151*
FREQ - M		.001***		.002***		-.000		.000		.001***
SLOW - 50		-.003*		.003		-.004***		-.010		-.003
CLED - HI		.002		.014***		.012**		.023***		.008***
CLO - WC		.004**		-.002		.013***		-.015***		-.001
IQ		-.021***		-.027**		-.026***		.008		-.008

*Significant at .05.

**Significant at .01.

***Significant at .001.

TABLE 4-9

WITHIN-COURSE-TYPE REGRESSION EQUATIONS FOR PROBABILITY OF TAKING ENTRY EXAMINATIONS TO INSTITUTIONS OF HIGHER EDUCATION ON CAREER PREFERENCE AND EXPECTATION VARIABLES AND COMMUNITY VARIABLES; MALE UPPER-SECONDARY SENIORS, 1966

	General B		General A		Agricultural		Commercial		Technical	
Mean	.904	.904	.098	.098	.090	.090	.175	.175	.136	.136
Equation Number	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)
R^2	.077	.178	.117	.279	.055	.139	.035	.182	.033	.157
F	13.446	15.306	6.369	8.010	6.122	7.335	3.358	8.983	7.997	18.870
Intercept	.990	.839	.340	.133	.370	.125	.430	.410	.355	.153
PF - GOV	--	--	--	--	--	--	--	--	--	--
ME	.049*	.053**	.071*	.046	-.058*	-.037	.011	.016	-.056*	-.031
BG	.076***	.055**	.106**	.077*	-.070*	-.058	.011	.004	-.014	-.001
SM	-.033	-.011	.016	.033	-.150***	-.114***	-.080	-.063	-.097***	-.058*
OTHER	.086	.084	-.042	-.026	-.095	-.077	.122	.057	.012	.016
EXPSTA	-.029***	-.016*	-.046***	-.037**	-.032	-.028***	-.053***	-.041***	-.033***	-.023***
EXP-OCC (III) 1	--	--	--	--	--	--	--	--	--	--
2	-.020	-.031	.023	-.026	.040	.010	-.060	-.057	-.046	-.053
3	.003	-.006	.168*	.102	.127	.063	-.030	-.002	.026	.012
4	-.029	-.006	-.081	-.054	.019	.019	-.043	-.011	-.051	-.057*
5, 6, 7	-.075***	-.048*	-.170***	-.159***	-.111*	-.115**	-.103**	-.063	-.082***	-.065**
8	-.192***	-.106***	-.163***	-.117***	-.078*	-.066	-.096	-.018	-.125***	-.055*
0	-.031	-.025	-.073	-.051	.020	.031	-.091	-.027	-.047	-.048
PC - GEN		-.069		.178		.167***		.242***		.223***
AG		-.076		.049		a		.274		.069
COM		-.294***		-.111		-.011		a		-.001
TECH		-.219***		-.084		-.006		-.020		a
T.J.C.		-.097***		-.056		-.013		-.043		-.026
OTHER		-.063*		-.057		.009		-.003		-.006
FREQ - M		.001**		.001**		-.000		-.000		.001***
SLOW - 50		-.002*		.001		-.003***		-.006		-.000
CLED - HI		.001		.013***		.015***		.021***		.010***
CLO - WC		.004***		-.002		.011**		-.014***		-.002
MOB - S		.003		.028		.011		.020		.007
BIG - S		.002		-.001		-.006		.003		-.006
IND - VS		-.007		-.004		.018		-.015		-.012
S4 - ALL		-.016**		.019		-.005		-.028*		.002

*Significant at .05.

**Significant at .01.

***Significant at .001.

Location and Classroom Composition, or M_i, L_{zi} and H_k

The task of reading and interpreting Tables 4-8 and 4-9 is facilitated by the fact that with a few important exceptions addition of the location, classroom composition, and other supplementary variables in regression equations (3) and (5) had only negligible effects on regression coefficients for other variables repeated from equations (2) and (4) respectively. Also, in every case the equation (3) and (5) regressions brought higher values for both R^2 and F than their equation (2) and (4) counterparts. It is convenient in view of this fact to look first at the last four variables common to equations (3) and (5), on Tables 4-8 and 4-9. In terms of our models, these variables fit quite well into the M_i, L_{zi}, and H_k slots, as indicated below:

FREQ-M, which is the frequency per day of public transportation to a metropolitan place of over a million,[1] is a good approximation for the concept of M_i in our model, referring to locational factors in the visibility of higher-level career options and their relationships to college attendance. It is presumed, therefore, to operate positively through effects on both relative earnings anticipations (Y_{zi} versus Y_{ti}) and perceived job options and preferences (J_{zi} and J_{ti}).

SLOW-50, which is transportation time, by ordinary public conveyances, to the nearest place of 50,000 population or more,[2] differentiates only among

[1] Those located in a metropolitan place of a million or more were arbitrarily coded 99. The frequencies otherwise ranged from 6 to 58 per day.

[2] Those living in a place of 50,000 or over were arbitrarily scored 1.

rural places and between rural and urban locations; it does not distinguish between larger and smaller urban centers. SLOW-50 is the best available indicator for L_{zi} of our model when we take z to refer to any and all varieties of higher institutions. Thus SLOW-50 enters our models mainly on the cost side. It's M_i implications, which cannot be totally cleaned out, are damped by inclusion in the same equation of variables specifying farm fathers and of FREQ-M.

CLED-HI and CLO-WC are what we have designated in our models as H_k variables, describing classroom compositional characteristics. CLED-HI is simply percentages of students in a classroom whose fathers had attended post-secondary institutions (whether junior college or university). CLO-WC is proportions whose fathers were in "white collar" employment, defining that category as indicated in the dummy variable set FO-III of Table 3-13. Used in an equation that includes parental backgrounds of individuals as well, CLED-HI and CLO-WC should pick up class-environment effects on perceptions of career options and the role of education in realization of those options. They operate, in other words, through G_{zyki} and G_{zjki} of our model.[1]

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[1] The last variable in equation (3), labeled IQ, is in fact not an Intelligence Quotient, but a self-ranking on a five-point scale in relative achievement among the youth's classmates. A low rating, in the bottom quintile, is score 1; self-assessment as in the top quintile scores 5. We should normally expect, other things equal, that the coefficients on IQ would be negative, as in fact most of them are--though they are insignificant among the commerce and the technical-school students.

The differences in behavior of coefficients on CLED-HI and CLO-WC across school types is particularly interesting. A comparatively large proportion of peers whose fathers are highly educated generally raises college aspirations even after controlling for the individual's own background (Table 4-8) or for his preferences and expectations (Table 4-9). This effect is strongest among the General A, commerce, and technical-school students. It is negligible among those in the General B curriculum, where college orientation was pervasive from the start. This, of course, is what we should have expected.

CLO-WC presents a more complex, and even confusing picture. To understand it requires awareness of contrasts among types of schools in the overall distributions of parental occupations. Fortunately, the behavior of this variable is essentially the same in Tables 4-8 and 4-9, which suggests that biases arising from multi-collinearity and interaction with other variables may be somewhat less serious than we might otherwise suppose. Furthermore, presumptive biases in the coefficients on CLO-WC are more likely to be positive than negative among the commerce students.[1] The strong negative coefficients on CLO-WC in the commerce regressions of both Tables 4-8 and 4-9 are all the more interesting when considered in this light. Going back

[1] Especially in Table 4-8. The coefficients on FARM 1 and FARM 2 are raised considerably in a shift from equation (2) to equation (3) in the General B and commerce courses.

of the evidence from these regressions, to examine the characteristics of white-collar parents of commerce students, the explanation is clear enough. In those schools a relative preponderance of fathers categorized as "white collar" constitutes, in an exceptional degree, a relative preponderance of lower-level clerical men, in contrast to the more progressive and successful business fathers among commerce student populations with lower "white collar" proportions.

The strongest unambiguously positive effects of CLO-WC appear among students in agricultural schools, where we are unquestionably picking up contrasts between relatively favored and urbanized rural groups at the one extreme, as against a predominance of sons of farmers and relatively unskilled rural manual workers at the other. Taking these observations together with the quite different picture in the commerce schools, it is evident that CLO-WC will have quite different relative meanings in these distinctive student populations, even if CLO-WC can be regarded as consistently specified in itself and stable in its absolute meanings across these course types.

Moving back up the tables, what results do we find on FREQ-M and on SLOW-50? The former of these variables (FREQ-M) comes through strongly as a good M_1 indicator precisely where we should expect it to be most discriminating, in equation (3) among General B and A students and students in technical schools. FREQ-M does very little to discriminate among agricultural students, where the SLOW-50 measure picks up its greatest strength,

with the expected negative sign. The fact that FREQ-M is somewhat less powerful in equation (5), which replaces parental background variables with expectation and attitude variables, is what we should anticipate if it is indeed operating as we implicitly hypothesized in specifying it as an index of M_i. The surprise is on Table 4-8 in the sizeable even though statistically insignificant positive sign on SLOW-50 for the General A students. This suggests that we may be observing a minor inversion (neutralizing L_{zi} cost effects) due to earlier constraints on options and inadequacies of information that were particularly severe among those of the General A students who reside in the remoter communities. Such an interpretation is consistent, at least, with evidence concerning General A students presented in Chapter III.

Socio-economic Backgrounds in the Stage II Decision

That parental background indicators are usually rather diffuse and poorly specified indicators of the critical decision parameters as these may distinguish various categories of young people at the transition from upper-secondary school to higher education or the labor market has been sufficiently emphasized. Nevertheless, effects of parental background traits on student career perceptions and on access to resources or funds for the financing of education (through I_i and W_i respectively) tend usually to operate in the same direction, which enables us to specify expected directions of effect and to obtain upper-limit empirical estimates of particular factors in the

decision process. We have already moved in this direction with Table 4-6, which concentrated on father's education. Equations (2) and (3), detailed in Table 4-8, incorporate a more complex array of background indicators. The reader should be warned, however, that on some curricula for some variables the cells are very small and the associated coefficients should be discounted or disregarded. The most extreme examples are: (1) sons of university men enrolled in agricultural schools, omitted altogether from Table 4-6 (where they constituted under 0.05 percent of the total sons of university fathers) and (2) sons of men in the highest occupational status category, OSTAS 1, in the General A and commerce curricula. In the agricultural school equations the group OSTAS 1 and 2 is in fact almost wholly OSTAS 2.

So far as parental education is concerned, the main results of the multiple regression analysis confirm the zero-order evidence from Table 4-6. Within course types there is indeed a substantial difference between the lowest parental education category (the omitted dummy) and all others, and the most impressive and consistent, monotonically rising effect of parental education on proportions of students taking examinations is for the General A students. In the commerce and technical streams we observe a consistent raising of the coefficient between sons of men at the middle school (FLEVS 3) and junior college levels, but not at the next step. These results are entirely consistent with the critical pre-sorting effects at the stage of

entry to general versus vocational schools and between General B and General A--together with a continuing but very limited elasticity in the educational system and in the subsequent paths open to graduates of the various upper-secondary courses.

Similar influences along with some that are quite distinctive are reflected in the coefficients on parental occupational status. There are some important variations in patterns from one curriculum to another. In the samples from the General B curriculum the omitted status category 5 is lower than any other except that for unskilled laborers (status 8), and this is despite the fact that these equations include separate variables for farmers' sons. A similar, though less extreme pattern is evidenced among General A students. Also, among the General B students there seems to be a dichotomization that sets sons of very well placed professional and white-collar men apart from sons of lower white-collar people along with manual workers. Among all sub-categories of General B students the norm is definitely to continue on to college or university, but in the upper status ranks this behavior approaches universality whereas among sons of lower white collar and manual workers proportions who take the examinations are more like four-fifths to five-sixths. The split on proportions taking examinations among students in the General A curriculum comes slightly lower, between status categories 4 and 5

Turning to students in agricultural courses, the most remarkable thing

about the OSTAS coefficients is their low gradient but consistency in ordering, with the result that though the pattern is systematic none of the deviations from the OSTAS 5 sub-group are significant. Technical school students display a somewhat similar pattern except for the significantly large negative coefficients for OSTAS 6, which seems in this case to reflect the special importance within the OSTAS 6 category for technical students of sons of traditional artisans and traders, who help account for the large negative coefficients on OSTAS 6 among commerce students as well. The really distinctive sub-group among the commerce students, however, is in the college-prone sons of successful businessmen, who predominate in OSTAS categories 2 and 3 for the fathers of commerce students. It is abundantly clear that this, like all occupational status scales, unavoidably picks up more than one dimension that is relevant to career expectations or so-called status inheritance. It is equally clear that allocations into the various upper-secondary curricula differentiate along other occupational dimensions that are incidentally associated with occupational status rankings--and these other dimensions go beyond the problem emphasized at the start, of the disturbing effects of including farmers in an occupational status ranking, no matter what status position they may be assigned.

It was in the next set of parental background variables on Table 4-8 that, in Chapter III, we picked up our best simple indicators of the incidence of special family-linked career options so far as the Step I decision among

upper-secondary curricula was concerned. First sons of farmers in particular attended agricultural schools and sons of independent businessmen (SELF 1 and SELF 2) were represented disproportionately among students enrolled in commerce courses. However, once this Stage I allocation has occurred there is considerable ambiguity about any further, Stage II effects of an F_i sort on the higher education decision. We do observe negative effects of being the son of a farmer among the General B students, and of being the first son of a farmer among the commerce students. The few second sons of farmers who were graduating from commerce courses were the most prone of the commerce students to continue into higher education; and paired with this is the least predictable finding in this set of independent variables--the high and significant coefficients (significant despite relatively small numbers) on the category SELF 2 for students in agricultural schools. These latter youth were decidedly the most college-oriented among agricultural-course students. In this pair of results we seem to be observing not so much a pull as, if anything, a push effect on career and educational plans so far as family-linked career opportunities are concerned.

Finally, we come to a set of variables that are very evidently associated with economic constraints on investments in schooling. This is the set categorizing a youth's father as actively employed full time (whether for himself or others)--FULL, as working part time--PT, as not working--NO, or as deceased. The agriculture students excepted, coefficients are

very generally negative, as we should expect. They are most significantly negative in the commerce and technical school samples for youth whose fathers were no longer living. These were also curricula that were most likely to attract such boys in the first place. The family income constraints (effects of low W_1) for such young people are an unmistakable and persistent factor in educational and career prospects and realizations.

Career Preferences and Aspirations in the Stage II Decision

Equation (4), shown in detail in Table 4-9, contained three sorts of preference or expectation variables. The first is a set relating to preferred employer or employment status in a permanent or peak career situation. The second (EXPSTA) is the status code for student's reported peak job expectation, and the third is a set of variables that specify occupational type on that expectation. The third set parallels the rubrics used for fathers on the set FO-III in Table 3-13.

A priori it might be supposed that upper-secondary-school youth preferring government jobs would be especially prone to seek higher education. Such indeed was the case among students in agricultural and technical schools. However, it was not the case among either General B or General A students, who more often took examinations when they preferred careers in the employ of large private corporations or as independent enterprisers in business or professional practice. Least oriented to college,

quite generally, were those expressing a preference for wage or salaried employment in smaller enterprises. These findings suggest some very important questions to be more fully explored with respect to characteristics of job opportunity structures in Japan and the operation of communication or information fields[1] in carrying messages related to career options. In particular, how do what sorts of information and impressions feed back to secondary-school youth and to those who council them, not by formal but rather by informal communication networks. Such explorations will require research well beyond the scope of the present study, though we will take a few steps in these directions when we come, in later chapters, to look more intensively into labor market perceptions of the upper-secondary graduates and their fathers.

In Table 4-9 the expected occupational status variable is treated in a simplified cardinal form, instead of as a set of categories such as we used with OSTAS in Table 4-8. The highest EXPSTA was coded 1, the lowest 8. The coefficients on EXPSTA are consistently negative, as we should predict if we suppose that the higher a youth's status goal the greater the likelihood that he will perceive higher education as a means to realization of that goal (and vice versa). The coefficients on EXPSTA were significant in all cases.

For all curricula associations between type of expected peak occupation

[1] On information fields see T. Hägerstrand, 1965 and 1968.

and the higher education decision separates out two groups at the extremes: (1) those looking forward either to manual occupations, however skilled, or to agricultural employment (codes 5, 6, 7, 8), who have low college-going rates, as we should expect, and (2) those looking forward to white-collar professional work and to high-level managerial posts, who are generally the most college prone. Among youth oriented toward careers as proprietors in trade or toward jobs as technicians, relative proportions going on to higher education differed with the type of secondary curriculum. Among students in the General B and A and in the agricultural courses, youth interested in work as technicians or as independent proprietors in trade were in about median positions among their classmates with respect to continuation into higher education. For the General B students this meant, of course, that most saw higher education as an intervening preparatory phase of their career paths, whereas relatively few among the agricultural students anticipated that route. Among students in the commerce and technical curricula, youth interested in ultimate work as technicians or trade proprietors rated low among their classmates in relative proportions seeking higher education; in these cases the upper-secondary curriculum was typically perceived as terminal vocational preparation.

Equation (5) adds to the variables of equation (4) not only the location and class-composition variables already discussed, but also what we termed in Chapter III "hindsight" upper-secondary course preferences, along with

four indicators of labor market perceptions or attitudes. Discussion of the latter would require a rather extended preliminary presentation of how the indicators were obtained. In view of their lack of significant associations with examination behavior, we defer that discussion to a more appropriate and meaningful context. The coefficients on course preferences behaved exactly as we should expect a priori,[1] which is simply to say that student perceptions and broadly observable actual associations between schooling and occupations are reasonably compatible; to this extent, at least, Stage II decisions and behavior (and adaptations of expectations to external constraints on options) are generally "rational."

IV. Economic Constraints on College Attendance and the Nature and Perception of Costs

The most immediate constraints on viable options in the higher education (and rōnin) decision are presumably of two main kinds. First is limitations on ability to perform satisfactorily on examinations, which goes back to the individual's genetic and social inheritance and to his upper-secondary-school experience. Second is the financial difficulties that may be entailed in meeting direct monetary outlays required for higher education and in accommodation to the immediate sacrifice in earnings foregone while continuing

[1] The positive associations between proportions taking examinations and a preference for agricultural secondary education among commerce and technical school students is an exception, but the total numbers of students in non-agricultural curricula expressing preference for the agricultural course was very low.

to study (including foregone contributions to the operation of a family business or farm). Though we specified ability cut-off constraints for particular k or z in delineating the decision models, both these and financial constraints are in practice matters of degree even within curricular choices; they are clearly matters of degree when the whole gamut of higher-education options are being considered in analysis of a college, non-college decision. Both ability and financial constraints have been considered to a limited extent in the immediately preceding pages, but using measures that were at the best indirect. In this section we take another step toward specification of economic constraints on the higher education decision, both overall and by the type of upper-secondary curriculum from which the youth are graduating. This discussion will be supplemented by bits of evidence relating to other constraints (including perceived ability constraints) and to time perspectives of college-going and non-college youth.

Parental Income as Constraint and as Opportunity

If higher education were a homogeneous consumer good sold at a standard price, if there were no non-monetary constraints rationing access to that good, if its acquisition did not entail major time costs (i.e., if this were not a time-intensive good from the point of view of the individual),[1]

[1] This not merely a matter of foregone earnings. For a recent interesting analysis of time scarcity and consumer behavior see Staffan B. Linder's The Harried Leisure Class (1970).

the analysis of effects of parental income on the higher education decision would be a relatively simple problem. We would want to determine the highest or saturation rate of purchase of this good at top income levels and to see how far down the income scale from the top the saturation rate persisted at any given "price" for the higher-education commodity; below that level we would ask how rapidly the rate of purchase fell off and at what income, if at all, it approached zero. So long as we were ready to accept an hypothesis that tastes were independent of income, and the income variable was not standing in for other relevant attributes as well as ability to pay, this would tie up the package so far as income effects were concerned. Why the saturation rate was substantially less than 100 percent, if that were the case, along with what factors sorted out the takers from the non-takers, would be a separate, however interesting, question.

Evidently, however, higher education is not homogeneous, its price to the individual is not standardized and is not even closely associated with quality, there are non-monetary constraints on access (some of which are definitely perverse in their effects on lower income groups), and this is most decidedly an intensively time-using good. It is also in major part an investment rather than an immediate consumption good, and returns to the investment may themselves be functions of both ability and social background of the individual. The fact that a few comfortably situated families may indeed send their sons, and especially their daughters, to college or

university with the idea that this is a luxury item, to be enjoyed before settling down to the main business of life (and hopefully in leisure moments thereafter) does not alter the strong and indeed predominant career element in the higher education decision. And this puts time right in the center of the educational decision in two quite distinct ways: First, it is there because of the intensity of use of personal time; whatever the purposes motivating a decision to seek further schooling the individual can implement that decision only by becoming directly involved in the process himself. But second, even if education were not so immediately time intensive in this personal sense, even if there were much wider scope for substitution of other factors than one's own time in the educational process, time comes to center stage in an educational decision because the benefits flowing from education extend over so long a period into the future.[1] This makes the rate of exchange (interest rate) in trading anticipated future for present purchasing power a critical factor in the financing of investment in the education of one's son (or one's self).

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[1] In this respect the purchase of education might be compared with the purchase of a house. However, the house can always be sold outright as a capital good, whereas only services but not the capital stock invested in a human being is normally treated as marketable property. This makes the timing of the education decision a much more critical matter, since to defer education will shorten the life-span of returns flowing from it and the period over which the investment must be amortized.

Considering education solely from an investment perspective, we may raise the question whether a priori any income effect at all is to be expected, and if so why. If we suppose for the moment that family income per se has no effect on relationships between the flow of future benefits from higher education and the monetary outlays and foregone earnings entailed in acquiring that schooling, why should parental income make any difference? Presumably it would not (other fortuitous taste or ability factors empirically associated with income aside) provided the society's institutions operated with perfect smoothness to provide credit facilities for investments in human beings.[1] But in fact in Japan as elsewhere there is ample evidence that the capital markets for such investments are in a very primitive state--if they can properly be said to exist at all in the sense of enabling a man to obtain credit, whether by loans or in an equity system, on the basis of his future earnings prospects. Under these circumstances access to funds for both maintenance and direct outlays on books, tuition, examination fees and so on depends on quite other aspects of the family's economic situation. This is why, with our initial presentation of the Stage I decision model (in Chapter III) we put W_i in the cost function, and why we will be looking at

[1] So long as the internal rate of return on an additional educational investment exceeded the interest-rate costs to the individual (the criterion rate properly assessed) that investment would rationally be undertaken, but if the criterion rate exceeded the anticipated internal rate of return this would not be the case. On this see especially Gary Becker, 1967 and Valerien Harvey, 1967.

family income first of all in a "constraint" perspective here. It is also why we suggested that in a reasonable approximation we might expect interest costs to rise exponentially with the funds needed from outside sources to finance education.[1] Given such a relationship we should predict systematic associations between family income on the one hand and both the higher education decision in general and choices among higher educational alternatives (and rōnin investments) on the other--any "consumption" aspects of the higher education decision aside.

Japanese Incomes and the Costs of Higher Education

Before turning to data concerning parental incomes and examination behavior in our student samples, it may be well to take a look at the orders of magnitude about which we are talking in a discussion of private costs of and ability to pay for higher education in Japan.

To start with, what cash outlays are typically involved, foregone earnings aside? It is useful as a starting point to go back to data for 1959 and 1961. The 1959 data are available in sufficient detail to enable us to identify just what was covered, and for 1961 we are in a position to compare

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[1]There is of course a foregone-interest cost when liquid resources are invested in a son's schooling instead of in other ways, but given the severe capital market imperfections for personal investments such foregone interest in the economically advantaged family would normally be very much lower than interest charged a poor borrower on funds to maintain himself while he devoted his time to acquiring greater future earning power--even supposing funds for such investment to be available to the poor man at all.

the cost or outlay figures with the most reliable of our estimates of annual earnings of Japanese wage and salaried workers by education and age.

In 1959 the total costs of tuition, fees, books, commuting expenses, lodging away from home, and other expenses directly associated[1] with attending university were as shown in the top section of Table 4-10. Tuition and fees in the private institutions were approximately triple those in the national institutions. As may be seen from the remaining columns, the 20,000 yen difference in tuition and fees accounts for approximately half the excess of total expenditures of students in the private as compared with the national day institutions. In addition, students going to private day universities payed very substantial entry fees in the freshman year.

The rows for "total" expenditures in the third part of Table 4-10 are roughly comparable with corresponding entries for day universities in the top part of the table. The classification into "school expenses" for 1961 includes not only tuition and fees but also individual purchases of books and commuting expenses. For students living at home those sums had risen between 1959 and 1961 from ¥ 32,000 to ¥ 36,000 in the national and from ¥55,000 to ¥66,000 in the private universities. Outlays on living expenses also rose substantially more for the students in private than those in public institutions.

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[1] For boarding students these sums include expenditures on food, however.

TABLE 4-10

PRIVATE COSTS OF ATTENDING UNIVERSITY, 1959 AND 1961

Part I. Annual Expenditures as of 1959 (Yen)[a]

Type of Institution	Tuition, Fees, etc.	Total Expenses (Including Tuition) by Type of Residence			
		Own Home	Dormitory	Boarding	Relatives
Day University					
National	10,340	52,700	82,100	110,500	86,100
Public	(12,000)[b]	56,300	85,700	114,100	89,700
Private	29,430	90,800	126,300	156,200	126,500
Night University					
National	N. R.	48,900	78,200	106,600	82,200
Public	N. R.	49,700	79,000	107,400	83,000
Private	N. R.	82,300	117,800	147,700	118,000

Part II. Entry Fees to Institutions of Higher Education by Curricula, 1959 (Yen)[a]

	Humanities and Social Science	Physical Science, Agriculture, Engineering	Medicine Dentistry Pharmacology	Other (Incl. Fine Arts)
Day University				
National	4,500	4,500	3,200	5,100
Public	9,100	6,400	19,600	8,700
Private	23,200	24,400	55,600	36,400
Night University				
National	5,000	2,900	...	5,800
Public	7,700	4,200	...	...
Private	15,900	15,700	...	18,700

Part III. Living Costs and School Expenses of University Students by Type of Residence, 1961 (Yen)[c]

	Own Home	Dormitory	Private Lodgings
National University			
School Expense[d]	36,246	27,668	28,812
Living Expense	35,774	71,687	99,759
Total	72,020	99,355	128,571
Private University			
School Expense	65,515	57,931	60,193
Living Expense	50,267	96,426	123,388
Total	115,782	154,357	183,581

[a] Source: Japan Ministry of Education, Higher Education and Government Loans, 1961 (in Japanese), p. 50.

[b] Estimated for this table from other data in source a.

[c] Ministry of Education, Higher Education in Postwar Japan, 1964 White Paper. Republished in English translation as Monumento Nipponica Monograph No. 22, Sophia University. These data are from p. 103 of the English version. Junior colleges are excluded.

[d] Includes expenses for books and materials and travel expenses to and from school.

The relative order of magnitude of these costs may be appreciated if we compare them with estimates of annual earnings of wage and salaried men who were in their peak earning ages in 1961. All cash earnings including bonuses ran at ¥840,000 for university graduates, ¥730,000 for graduates of junior colleges or their equivalent, just over ¥500,000 for graduates of middle or upper-secondary schools, and ¥400,000 (approximately $1,100) for those with compulsory or youth schooling only.[1] The major part of the Japanese population in the age brackets of fathers of the 1961 cohort of upper-secondary graduates were in this last, lowest education category. It must be evident that even setting aside the high entry fee for private universities, the extra annual financial burden of sending a son to a private institution would have been virtually prohibitive for these lower-income families, even when the son lived at home. In fact as of 1961 54 percent of the students in private universities were from families in the highest income bracket reported, with $2,000 or more a year, whereas only 27 percent of the students in the national universities were from such homes.

Both incomes and expenses of attending institutions of higher education climbed over the decade of the 1960's. Effects on the average outlays (including lodging away from home) among the students of 1968 are reflected in Table 4-11. The mean expenditure column is very revealing. It

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[1]These estimates, which are based on an analysis of published statistics from several primary sources, are from another manuscript in preparation under a grant from the Carnegie Foundation.

TABLE 4-11

PRIVATE DIRECT COSTS INCURRED BY FIRST-YEAR COLLEGE AND UNIVERSITY STUDENTS; DISTRIBUTIONS BY CONTROL-TYPE OF UPPER SECONDARY SCHOOL AND OF HIGHER INSTITUTIONS ATTENDED, 1968

	Number of Graduates in Higher Education (Full-time)	Mean Expenditures (thous. yen)	Percentages Spending (in thousand yen)		
			Under 1,000	..,500 or More	2,000 or More
Category of Upper Secondary School					
National	1,800	2,120	18	55	32
Public	220,100	1,350	43	22	9
Private	132,400	1,850	27	42	23
Category of Higher Institution					
Full-time Day:					
National University	47,600	1,190	52	17	7
Public University	6,500	1,310	44	20	9
National or Public Junior College	6,600	1,190	51	16	5
Private University	182,400	1,630	33	33	17
Private Junior College	101,700	1,610	33	33	17
Full-time Night University or Junior College	9,500	1,160	59	16	7
All Students	354,300	1,540	37	30	15

Source: MEJ 6736, p. 24.

demonstrates, for one thing, the continuing higher cost to the individual of attending private institutions of higher education as compared with the national institutions. This cost difference is far more important than any cost differences within the national or the private category as between universities and junior colleges. Equally interesting, Table 4-11 tells us some important things about the presumptive status of students graduating from the national and the private as compared with the public upper-secondary schools. Despite their links with and comparatively ready access to the heavily subsidized national universities, on the average graduates of the national upper-secondary schools who sent on to higher education were spending more, not less than other upper-secondary graduates on their first year at college or university. The lowest average expenditures in college were those of the largest group of upper-secondary youth, the graduates of the public institutions. These youth come from economically very diverse backgrounds, more nearly representative of an economic cross-section of the population than the young people who had gained entry to the prestigeful national schools or those whose families had financed them in the private sector of upper-secondary education.

Once again, if we are to appreciate what expenditures such as these may mean to a Japanese family contemplating investment in a son's (or daughter's) post-secondary schooling we need to know something about the relative magnitudes of incomes and educational outlays. Including an

adjustment for bonuses and other monetary fringe benefits, we estimated the 1966 incomes of wage and salaried men at their peak earnings ages to be around ¥1,200,000 for university graduates, ¥1,000,000 for graduates of junior colleges and related institutions, ¥700,000 for graduates of senior-secondary schools and ¥500,000 for men with compulsory or youth education only.[1] The corresponding 1966 earnings for fathers aged 50-54 in our study sample of "fathers" were respectively ¥1,220,000, ¥1,080,000, ¥880,000 and ¥730,000. Against this background we may better understand the implications of both the mean expenditure data in the second column of Table 4-11 and the clues to distributions of expenditure levels in the last three columns of that table.

It is immediately obvious that the young people spending over ¥200,000 (last column of Table 4-11) would rarely come from families of wage or salaried men lacking any higher education, though they might be (and often are) sons of economically successful but more modestly educated business enterprisers. The large minorities spending over ¥200,000 among youth graduating from the national upper-secondary and, less dramatically, from the private upper-secondary institutions reflect the economically advantaged backgrounds of large fractions of the student bodies of those schools as compared with the student

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[1] These estimates also (like those for 1961) combined use of data from several published sources and are described in another manuscript, currently in preparation under the Carnegie grant.

populations of the public upper-secondary institutions. On the other hand, in 1968 three-fifths of the students enrolled in night courses and half of those enrolled in national universities or junior colleges spent less than ¥100,000 on a first year in college or university study.

For university and junior college men the estimated incomes of employee fathers match very closely those estimated in our independent and very different manipulations with published statistics on the wage and salaried labor force. On the other hand, incomes of employee fathers who had completed middle levels of schooling and who had compulsory education only were higher than those of the corresponding age and education categories in our estimates using the published statistics. This suggests that over the higher income range parental income will be of little relevance in the upper-secondary education decision, at least among sons of salaried men. On the other hand, selection against attendance in upper-secondary schools is clearly indicated over the lower income range. Data cited earlier support this as a more general proposition; they showed that once a level of approximately ¥600,000 in family income as of 1960 was surpassed, income made very little difference to rates of entry into day upper-secondary schools among young folk completing the compulsory years, but that below that income level the rates of continuation into upper secondary education were cut back sharply.[1]

In the following pages we will make use of our sample data for a more

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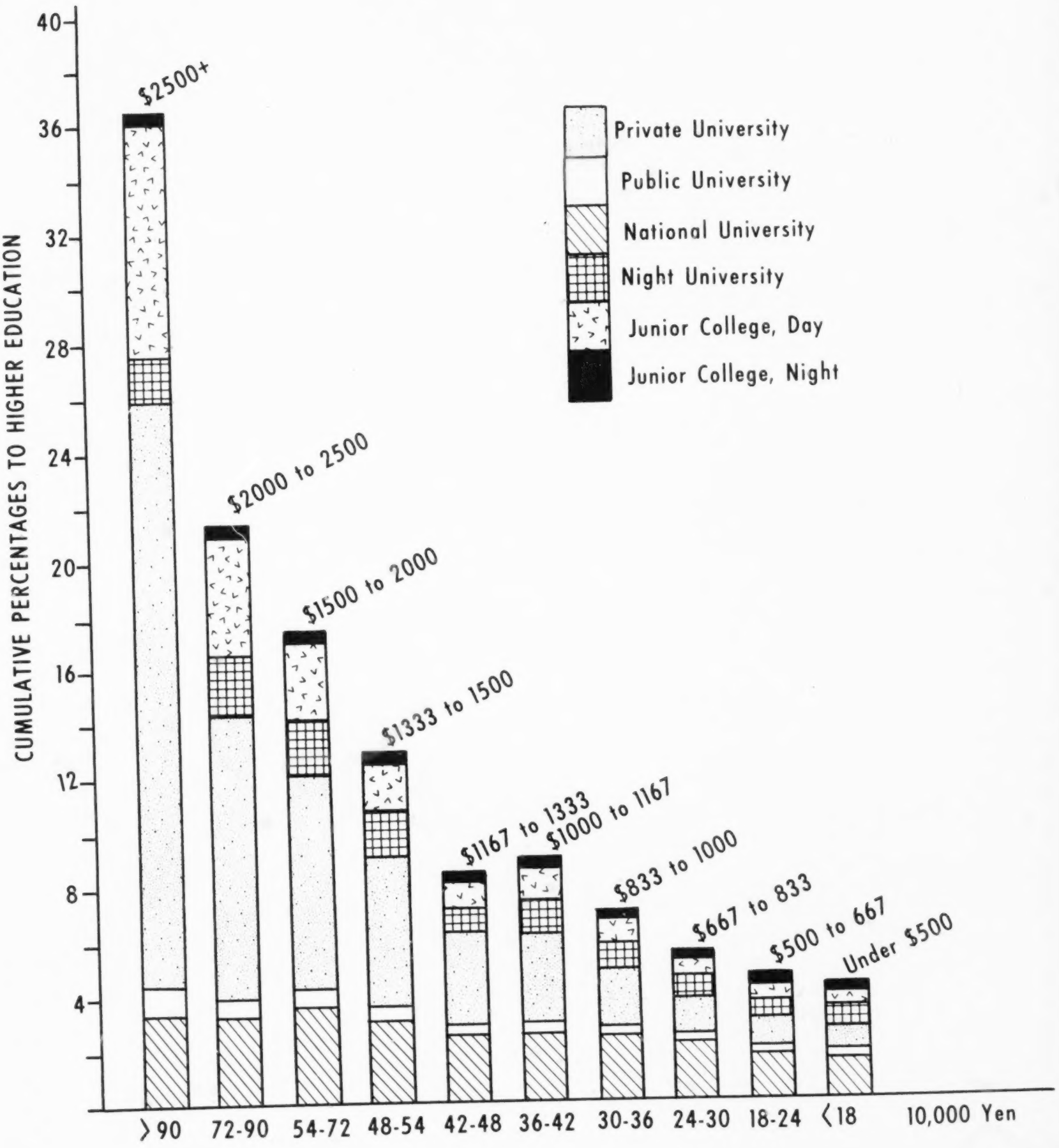
[1] Infra, p.

direct examination of associations between parental incomes and college orientations, but before doing so it may be of interest to look at the evidence on income-selectivity into higher education collected by the Ministry of Education with reference to the 1959 cohort of upper-secondary graduates. Findings from that survey, which refer to an entire age cohort and not merely those with upper-secondary schooling, are presented in Figure 4-1 in the form of a bar diagram. (Again we are handicapped in the lack of data by sex.) Both the actual yen figures and approximate 1960 dollar equivalents are entered in the diagram to facilitate its interpretation. Looking first at the total length of the bars, disregarding their composition, we see that rates of college entry rise slowly at first; the poor boy faces many difficulties and poor youth were underrepresented in the upper-secondary streams to start with. Nevertheless, four to five percent of these poorest young people entered institutions of higher education. The proportions begin slowly to rise at around $900 and reach 8 to 9 percent between $1,000 and $1,300. After that the pace of increase accelerates, both because of increased rates of college attendance among males and because more females are coming into the picture. Above an annual family income of $2,500 we are evidently witnessing the effects of three factors each of which is manifested in higher rates of attendance at the private universities and the junior day colleges but not elsewhere. These are: (1) an increased rate of college attendance among youth who are not particularly high in academic achievement but who see higher education as important for their future career

Fig. 4-1

Percentage of the Age Groups Entering Higher Education in 1960 by Family Income Classes



prospects, (2) probably an increased representation of young men with a wide range of competencies who conceive continuation in school primarily as a consumer luxury, and (3) a quantitatively important increase in the rate of attendance among young women. The first two of these categories (but especially the first) increase because at higher income levels families can pay for tutoring and other supportive features of getting their sons into universities in the first place and of maintaining them at the relatively high-cost private institutions thereafter.

The Study Sample and the Parental Income Measures

Even under the best of circumstances there are always problems in a proper accounting of incomes and in income comparisons across broad categories of recipients such as wage and salary men, men in independent business and professional practice, and farm operators. We made no attempt to merge estimates in a single continuum. Instead we have treated sons of men in wage or salary employment and sons of men in independent or family enterprise as separate student (and father) samples. Sons of farmers are omitted in this analysis.[1] The income data were obtained on questionnaires from the fathers themselves.

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[1] A special study of farmer fathers, currently nearing completion, has been financed by the Carnegie Foundation. Mr. Harker, who is carrying out that research, hopes also (jointly with Miss Bowman) to prepare a special analysis of farm income and other characteristics in relation to schooling and career perceptions of farmers' sons. There are some features of these relationships that distinguish them markedly from the patterns for sons of men in other occupations.

In the case of employee fathers we derived annual earnings estimates from answers to questions concerning total monthly cash income (base pay plus a variety of other cash payments received by Japanese employees) and information on bonuses received over the course of the year. The bonus payments run as high as a third or more of total annual earnings in some employment situations and their inclusion was obviously essential. The most serious gap in the earnings figure is for payments in kind, of which there is a wide variety, especially in the big firms. However, the payments in kind are less important for our purposes than might at first be supposed. For one thing, company housing, which can be an extremely important component in the incomes of young workers (where it commonly may take the form of dormitory hostels), is of limited absolute and relative importance among fringe benefits accruing to households of mature family men. Also, a large part of the bigger payments in kind take an essentially luxury form. Such receipts are not substitutable for ordinary living expenses and are irrelevant in estimating real disposable income from which investments in education might be financed; for our purposes they are very properly excluded. However, such is not the case with respect to other sources of income, as from rents or securities or a share in returns to a family enterprise and so on. Lack of information on such income for employee fathers reduces our estimates of total family incomes. There is unquestionably a positive correlation between the errors of omission and the estimated earnings; and the use of father's earnings to represent family income accordingly presents a

distribution that has less variance and may have substantially less skewness than the true family income distribution. Exclusion of part at least of the "transitory" or windfall components in property incomes (positive or negative) may be an advantage, but this does not neutralize the fact that omission of the more stable "permanent" component in income from other sources may reduce the predictive power of our income estimates; it will have that effect so long as the other incomes are only very loosely correlated with earnings. On the other hand, to the extent that other income sources are positively associated with earnings, their omission will bias upward the estimates of metric regression coefficients, and hence of marginal effects of family incomes on the predicted likelihood that a young man will take examinations for higher education; it could introduce such a bias even without affecting the coefficient of determination or its significance.

Income estimates for independent business and professional men and their families were taken from two summary questions asked of these fathers. The first referred simply to gross annual sales of the family enterprise, or of that part of it for which the respondent was responsible. The second was a net-income question, referring to what the family received after deducting expenses of operating the enterprise. Although other data relating to the business were obtained, they were not sufficient to allow a full accounting, adequate for use as a check against the reported net family income. That data such as these will contain a very wide margin of error must be obvious. We may take some

solace from the strong presumption in this case that reports of net family returns are tacitly corrected by the respondent to eliminate effects of exceptionally bad or exceptionally good years; some part at least of the transitory component in these incomes has been purged from the estimates. However, the statistical "noise" created by both remaining transitory components and sheer error is undoubtedly substantial, and we have no evidence concerning the existence or non-existence of autocorrelation between the observations and the error terms.

The particular functional forms assumed in studying relationships between parental incomes and college-going behavior may be important for the results, especially where income distributions are highly skewed. In that case use of the raw income data in a linear regression model may give too much weight to effects at the high income tail relative to the median or lower incomes. Using a logarithmic transform shifts the emphasis in measurements of association to give more weight to absolute differences in the lower income ranges, which should pick up more of the cost-constraint effects of parental incomes on college attendance as an investment phenomenon. For the sample of sons of independent business or professional men, use of logarithmic transforms would clearly have been preferrable. Whether that alternative would have been as suitable (given the characteristics of the earnings data as indicators of family income) for wage and salary employees is questionable. But whatever the best solution might have been, in fact our initial regressions, some of which are

shown in Table 4-12, were quite inadvertently run using the raw data only. We considered re-runs with logarithmic transforms, but decided that it might prove more interesting instead to try to identify the possible forms of relationships by an analysis treating detailed income classes categorically. The results of this later analysis, which explored associations with ronin attitudes and with stated reasons for not attending college (despite the desire to do so) will be presented at the close of this discussion of economic constraints and college costs.

Parental Incomes and College Attendance; Some Regressions

Against these background remarks, the data shown in the upper rows of Table 4-12 should be of considerable interest. Taking all students together, regardless of course type, the difference between the income estimates for employee and for independent fathers is dramatically displayed. The former report mean incomes only half of the mean for the latter. However, it must be remembered that the income data for families of employed men refer to the earnings of one man only, whereas the data for men in independent and family enterprise come closer to being total family incomes. Differences in variance and skewness are also obvious. Whereas the standard deviation of employee annual earnings was only ¥479,000 against a mean of ¥770,000 (a coefficient of variation of .62), the standard deviation of net family incomes among the independent enterprisers exceeded four million yen, with a coefficient of

TABLE 4-12

PARENTAL INCOMES AS A FACTOR IN COLLEGE EXPECTATIONS; SUB-SAMPLES BY PARENTAL EMPLOYMENT STATUS AND TYPE OF COURSE (EXCLUDING SONS OF FARMERS)

	All Courses	General B	General A	Commerce	Technical	Agriculture
Number of Cases in Sub-samples						
Sons of Employees[a]	2,078	619	81	335	986	57
Sons of Self-employed (and family bus.)	1,001	219	48	241	388	25
Percentages Taking Examinations for Day College or University						
All Students	39%	93%	22%	18%	15%	5%
Sons of Employees	41%	96%	12%	20%	17%	27%
Sons of Self-employed (and family bus.)						
Adjusted Annual Earnings of Employee Fathers						
Mean (thousands of Yen)	770	933	661	683	715	622
Standard Deviation	479	568	323	287	466	265
Zero Order Correlation with (EXAM)	.269	.145	.339	.270	153	.033
Partial Correlation Coefficient (1)[b]	.162***	-	-	-	-	-
Partial Correlation Coefficient (2)[c]	.096***	-	-	-	-	-
Partial Correlation Coefficient (3)[d]	.126***	.070	.218	.194**	.110**	.061
Partial Correlation Coefficient (4)[e]	.117***	.046	.191	.170*	.110**	.017
Net Annual Parental Income. Fathers in Own or Family Employment						
Mean	1,501	1,868	943	1,849	1,110	930
Standard Deviation	4,375	3,669	916	7,477	1,938	1,889
Zero Order Correlation With (EXAM)	.044	.044	.353*	.233	.022	-.016
Partial Correlation Coefficient (1)[b]	-	-	-	-	-	-
Partial Correlation Coefficient (2)[c]	.127	-	-	-	-	-
Partial Correlation Coefficient (3)[f]	.062	.015	.091	.142*	-.076	...
Partial Correlation Coefficient (4)[g]	.063	.022	-.520	.179*	- 090	...

[a]Number of sons included are those whose fathers returned questionnaires and provided the necessary information for estimating their earnings or net incomes.

[b]Other independent variables: course type set only.

[c]Other independent variables: dummy sets for course type, for father's report of his and his father's education and occupation; for sons of self-employed also whether student was the oldest and/or only son.

[d]As c) but excluding course types.

[e]As d) but adding variables referring to student job expectations, preferences, and self-assessment of rank in class.

[f]As d) but adding location and class-composition variables.

[g]As e) but adding location and class-composition variables.

variation of 2.91. Reported incomes of employee fathers had some moderate positive skewness, and the skew (along with the mean) would unquestionably have been increased with a better income measure, but hardly to an extent comparable with the tailing out into the upper reaches among the independent business and professional men.

Income selectivity into college-oriented upper-secondary curricula is evident enough in the contrast for both groups between mean parental incomes of General B and most other students, but especially the predominantly rural students in the General A and agricultural courses. However, the strength or weakness of measured income as a factor in the explanation of likelihood that a youth will actively seek higher education--and how far the process operates through Stage I allocations, how far within curriculum categories thereafter.--is another story.

Among sons of employees it seems quite clear that effects of parental income on college attendance operated both in initial selection or self-selection into General B and then subsequently again as a factor in college attendance among graduates of the commerce, technical and General A streams. In the General A sample the zero-order and partial correlation coefficients, though the highest of any, are not statistically significant; this reflects the small numbers

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[1]Note that instead of presenting the metric regression coefficients in Table 4-12 we show zero-order and partial correlation coefficients, which are more revealing given the problems of comparability in absolute income terms.

of non-farm youth in that sample. Non-farm wage workers whose sons attended agricultural schools had low incomes, with very small income variance, and only five percent of their sons reported any attempt to gain access to higher education. The pressure of economic constraints, along with other discouraging factors, precluded college attendance for most of these youth from the start.

Results with the net family income measures for fathers in independent and family business are quite different. Overall their incomes as measured play very little part in determining college orientations; none of the coefficients in the total column are statistically significant and the highest of them is still only .127. On the other hand, at almost two million yen the mean income for fathers of youth in General B curricula is very substantially above the mean for any other group except commerce schools. The commerce exception is of special interest, and so is the relatively high percentage of sons of self-employed and family enterprisers who enrolled in the commerce courses. It is there that we find the most extreme skewness of all; mean incomes of these commerce fathers were three times the median income for the sample.[1] It is within the commerce samples that the perceived value of college education for

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[1] Measuring skewness by the ratios of mean to median incomes we get the following:

	All	General B	General A	Commerce	Technical	Agriculture
Employee Fathers	1.09	1.13	1.07	1.02	1.06	1.00
Independent Fathers (SELF)	1.46	1.56	1.40	2.99	1.53	2.15

the family business comes most clearly into play, and in association with the scale of that business, but it is also among sons of successful independent businessmen (whatever their curriculum) that the approach to college options can be most relaxed. The income mean for self-employed fathers of youth in the agricultural schools is misleading; the median annual income reported by these families was only ¥432,000, or $1,200 a year; this is lower than the median for employee fathers of youth in agricultural schools.

Some Reactions to Hypothetical Windfalls

As minor supplementary evidence we included in the student questionnaires a question concerning how the respondent would use winnings of a million yen in a lottery, and also a question as to his preferences between a million yen now and various sums five years hence. The results are shown in Tables 4-13 and 4-14, where they are tabulated against college expectations or attitudes. The classification used on college plans is that developed by Professor Ikeda in his article on "College Aspirations and Career Perspectives among Japanese Senior Secondary Students," which is included as one of the special appendixes to this report. The first category, appearing as the first column in these tables, refers to students taking examinations for entry to a full-time day college or university. The second refers to the small group (3 percent of our sample) taking examinations for night institutions, the third, Yes/No column, refers to those (a sixth of the total) who expressed a wish

that they could go on but who were taking no concrete steps to do so. The last column is those who expressed no interest in or desire for higher education of any kind.

The distributions in Table 4-13 distinguish the prospective day and night students just where we might expect the differences to show up if very few were close to an indifference margin between the day and night options. The night students more often chose a use of the supposed winnings to acquire productive capital in land or a business; in this respect they closely resembled the Yes/No and the No-interest-in-college categories of graduates. On the other hand, they came close behind the day university aspirants in proportions specifying use of their winnings for "education." The proportion making that hypothetical choice is cut in half when we go from the night school to the Yes/No group. These responses give no very strong support to the notion that inability to finance further education plays a predominant part in the self-selection out of candidacy for most of the students involved, though it may be the dominant factor for some.

One thing seems certain. The decision to seek or not to seek higher education is quite unrelated to time preferences, at least as these may be revealed by choice among the options presented in Table 4-14. If anything the college-directed young men are more rather than less inclined toward the cash-now option even at future/present trading ratios in the range 1.5 to 2.0. This could reflect their greater mathematical or financial sophistication rather

TABLE 4-13

PERCENTAGE DISTRIBUTIONS OF RESPONSES ON UTILIZATION OF HYPOTHETICAL WINNINGS OF ONE MILLION YEN IN A LOTTERY, BY PRESENT COLLEGE PLANS

	Day University	Night University	Yes/No[a]	No Interest in College
	Number of Students			
Total	100%	100%	100%	100%
College Expenses	26	20	11	1
Start Business	7	13	12	14
Buy Land	17	23	22	28
Save in Bank Deposit	25	23	28	32
Travel	13	12	14	12
Other	10	8	11	11
Non-response	2	1	2	2

[a]State would like to go to college, but not taking any examinations.

TABLE 4-14

CUMULATIVE PERCENTAGES PREFERRING A GIFT OF 1,000,000 YEN[a] NOW TO DESIGNATED AMOUNTS GUARANTEED FOR FIVE YEARS HENCE, BY PRESENT COLLEGE PLANS

Amount Guaranteed 5 Years Hence	Day University	Night University	Yes/No[b]	No Interest in College
	Number of Respondents			
2,000,000 Yen	9.4	11.4	8.1	7.1
1,750,000 Yen	21.2	21.1	19.4	18.1
1,500,000 Yen	41.7	36.0	38.5	35.7
1,250,000 Yen	77.8	74.6	77.2	75.3
1,000,000 Yen	94.9	92.5	95.0	95.6

[a]Approximately $2,800.

[b]State would like to go to college, but not taking any examinations.

than any greater (or lesser) limitation in their perceptions of the future and the time horizons of their thinking.

Parental Incomes and Stated Reasons for Non-continuation Despite Preferences

More direct evidence concerning reasons youth expressing a wish to continue into higher education are not expecting to do so are provided in summary form in Table 4-15. For this tabulation we have returned to a comparison by types of upper-secondary schooling. It is important in reading the percentage distributions in this table to bear in mind that they apply to very different proportions of the total graduates of the various curricula (shown in the first row of the table).

With the partial exception of young men graduating from the agricultural schools, two responses dominate all others These are first inadequate scholarly ability as assessed by the individual himself, and second the burden of direct costs in fees and tuition. It is notable that for the total sample, taking all curricula together, a third gave tuition and related costs as their "principal reason" even though only 11 percent of the Yes/No group specified that they would use lottery winnings to defray educational costs. These answers are not necessarily inconsistent, but there must be at least a suspicion of upward bias in the high proportions (according to Table 4-15) specifying tuition and related costs as the principal barrier to further schooling.

The entries after family business reenforce observations made earlier

TABLE 4-15

PRINCIPAL REASON CANNOT CONTINUE INTO HIGHER EDUCATION; RESPONSES OF STUDENTS WISHING BUT NOT EXPECTING TO GO ON, BY COURSE IN WHICH ENROLLED

	Course Type				
	General B	General A	Agri-culture	Commerce	Technical
Percentage Giving Yes/No Responses on College Plans[a)]	3	19	17	24	29
Number Giving Principal Reason	57	99	196	248	749
Percentage Distribution of Principal Reason					
Total	100	100	100	100	100
Direct costs (Tuition fees, etc.)	35	41	20	32	32
Family business	7	4	26	10	2
Parents opposed	-	4	2	1	1
Present course inappropriate	-	8	14	13	18
Inadequate scholarly ability	46	37	34	37	41
Other	12	6	4	7	6
Percentage of Total Giving Economic Reasons[b)]	1.4	8.6	7.8	10.1	9.9

[a]Yes/No responses on college desires (Yes) and Exams (No).

[b]Counting as "economic" the responses direct costs and family business.

with reference to family-linked options and family pressures in these matters among agriculture and commerce students. It is the former, however, who most often experience strong pressures to become directly involved in family economic ventures running counter to the individual's educational and career preferences.

For non-farm youth, further evidence on some of these matters is provided in Table 4-16, which presents some summary data concerning parental income distributions within categories on reasons respondents gave for not expecting to receive higher education, despite wishing that they might do so. Taking all students together, regardless of type of secondary curriculum, there are striking contrasts in economic background among students who gave cost burdens as the principal reason and those specifying obligations to go directly into the family business. The former have the lowest median incomes, the highest proportions under 500,000 yen a year; proportions in the upper relative income brackets are few. By contrast, those specifying family business as a reason are typically in a strong economic position, at least relative to other groups who wish to go to college but will not. They have by far the highest median incomes, the smallest proportions in low income brackets, and strikingly high proportions in the upper income ranks. Among sons of independent entrepreneurs, the closest in income patterns to those specifying cost burdens are students who indicated that their upper-secondary courses virtually precluded entrance to university, undoubtedly reflecting in

TABLE 4-16

PARENTAL INCOMES AND REASONS FOR NON-CONTINUATION: STUDENTS WISHING BUT NOT EXPECTING TO ENTER INSTITUTIONS OF HIGHER EDUCATION

	Non-Farm Fathers in Own or Family Enterprise: Net Incomes, 1966				Fathers in Wage and Salaried Employment Annual Earnings (Incl. Bonus) 1966			
	Number Reporting[a]	Median Income (Thous. Yen)	Percentage with Incomes: Under 500,000 Yen	Over 1,500,000 Yen	Number Reporting[a]	Median Income (Thous. Yen)	Percentages with Incomes: Under 500,000 Yen	Over 1,000,000 Yen
All Students in:[a]								
Entire Sample	1,035	1,025	23.3	22.8	2,136	708	22.1	16.3
General B	304	1,200	15.7	35.4	628	827	9.9	28.9
General A	50	672	28.0	16.0	85	618	31.8	11.8
Agriculture Course	24	432	62.5	4.2	60	623	40.0	8.4
Commerce Course	244	619	24.2	20.8	335	673	23.6	10.2
Technical Course	398	725	25.8	15.8	993	661	27.5	11.0
Students Desiring but Not Expecting to Enter Institutions of Higher Education								
All Students, by Reason Not Going On								
All Reasons	177	730	27.1	19.8	441	646	28.3	7.3
Cost Burden	39	600	35.9	5.1	155	552	42.0	3.7
Family Business	27	1,200	14.8	37.0	...	...	...	...
Course Inappropriate	28	750	32.1	14.3	76	732	22.4	13.1
Poor Scholar	72	950	25.0	23.6	175	677	19.4	7.5
Technical-school Students by Reason Not Going On								
All Reasons	111	688	29.7	15.3	303	658	27.1	8.7
Cost Burden	29	587	37.9	6.9	100	550	42.0	4.0
Family Business	9	875	11.1	22.2	...	...	...	...
Course Inappropriate	21	812	28.6	9.6	59	741	20.3	15.7
Poor Scholar	48	702	31.3	20.8	122	679	14.3	9.0

[a]For totals by course these samples include only students responding on the rōnin question.

part the effects of economic constraints in the earlier decision to enter presumptively terminal rather than college-preparatory curricula in upper-secondary school. Two quite distinct forces are clearly operating as revealed in these data. Economic constraints are dampening or blocking access to higher education both immediately and as reflected in the earlier, Stage I decision. At the same time, among the youth included in all but the top section of Table 4-16 we find a special but important sub-category whose family-linked obligations and opportunities discourage college attendance. These are sons of families conducting at least reasonably successful enterprises seen as having first claim on the graduate's time and as providing an appropriate career for him in which neither he nor the family as a whole would benefit substantially from his further schooling. There are other successful independent and family enterprisers, as we have already seen, who make the other assessment even as a family matter, judging that the youth would serve the family enterprise best by first continuing through higher education.

Among sons of wage and salaried men family-linked enterprises are virtually (not quite) excluded almost by definition. But there are other differences from sons of independent and family enterprisers as well. Among the sons of employees the only important income contrasts in Table 4-16 are between those specifying costs as the principal problem or impediment to college attendance as against all other response categories. Two-fifths of the employee fathers of young men specifying the cost barrier had annual earnings below

¥500,000 and the median for this group was only ¥552,000.[1]

The only course type with sufficient numbers of respondents in most or all of the response categories on "principal reasons" to justify internal comparison was the technical course. The distinctively low incomes of those specifying cost burden is again evident, both for sons of independent enterprisers and of wage and salaried men.

Parental Incomes and the Rōnin Year

The importance of the rōnin phenomenon, its incidence with respect to origin (in national, public or private general schools and vocational schools) and to higher-education goals, and its relationship to school grade averages were all discussed briefly earlier in this chapter. Being a rōnin may be in itself an expensive matter because of the delay in labor force participation--though there is probably more incidental part-time wage work among rōnin than is usually remarked or gets recorded. But the matter is much more complex than that.

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[1]Turning these figures around to ask how youth from the poorest versus better situated homes responded, we get the following results for proportions specifying cost burdens and inappropriate course types:

	Cost Burden	Course Inappropriate
Fathers in independent enterprise with net incomes of:		
Under ¥500,000	29%	19%
Over ¥1,000,000	10%	15%
Employee fathers earning per annum:		
Under ¥500,000	52%	14%
Over ¥1,000,000	3%	5%

One of the items on our questionnaire asked about attitudes with respect to becoming rōnin if necessary to gain entry to the respondent's preferred institution or course. Translated from the Japanese, that question read:

> 16. Will you seek to gain entry to your first choice of college or university even if you are not admitted this year and would have to spend a year or so as a Rōnin? Circle the answer that applies.
>
> 1. I won't go to university anyway.
> 2. Yes, even if have to spend time as a Rōnin
> 3. No, would not spend time as a Rōnin
> 4. Not sure

Although conditional "if" questions are always hazardous, this question is one that is inevitably very much in the minds of seniors in the upper-secondary institutions as they approach the time when they will take examinations for higher education, and the question was intensely meaningful to them. Whether responses predict well what happens when this contingency actually arises we do not know, but the degree of assurance in most of the Yes and the No positions suggests that the correlation should be high.

The decision whether to be a rōnin, like other decisions pertaining to educational investments, has both a cost and a benefit side. When the various ramifications are taken into account, whether being a rōnin is a

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The sharper contrast among sons of employee fathers may well arise because these incomes are inherently better indicators of "permanent" incomes, with less transitory or random components.

costly alternative from the perspective of the individual or family must be open to question. Even if we exclude from consideration actual and perceived differences in the stream of future benefits accruing with enrollment in the preferred versus other institutions (the question of being a rōnin to gain admittance anywhere aside), it is still possible that to take up an available place in a private institution might be more costly than to take out a rōnin year during which a youth prepared successfully for entrance into a national university where, for the four ensuing years, his costs would be heavily subsidized. It is also possible that among many ambitious but poor youth education may be perceived as offering the only visible road to socio-economic mobility. We might expect, other things equal, that relatively few of the sons of families under the most severe financial stress would seriously contemplate the rōnin route, but the questions are whether at such an economic level they would contemplate higher education at all, and once youth do look to higher education does the rōnin path loom larger among those with low or those with high incomes?

An overview of attitudes toward being rōnin is presented by type of upper-secondary curriculum in Table 4-17. The General B students are divided relatively evenly between three attitude categories. Because ninety percent of the General B students were anticipating college, these figures imply that of all General B graduates 28 percent report that they definitely would take a rōnin year if need be and three-fifths (62 percent) would or

might do so. The predominantly rural youth in the General A and agriculture curricula rarely contemplate continuing to higher education, and among the small numbers taking examinations a smaller proportion express definite commitment to taking the rōnin route if necessary to attain their educational goals. These students along with the college-directed commerce students are the most inclined to take a firm negative position on the rōnin question; they are also less likely than students from other courses to have focussed their hopes on institutions of higher education that are among the most difficult of access, with swelling demands relative to places.

TABLE 4-17

ATTITUDES TOWARD BECOMING RŌNIN BY TYPE OF SECONDARY COURSE

	Type of Course				
	General B	General A	Agriculture	Commerce	Technical
Percentage Taking Exams	90	10	9	18	14
Distribution of Those Taking Exams by Attitude on being Rōnin					
Total	100%	100%	100%	100%	100%
Yes, definitely	31	23	23	27	43
Uncertain	38	39	33	33	36
No	31	38	44	40	21
Percentage of All Students Who Definitely Would Be Rōnin	28	2	2	5	6
Percentage of All Students Who Might or Definitely Would Be Rōnin	62	6	5	11	11

Particularly interesting are the responses among the college-directed technical-school graduates. A seventh of the technical-school students were taking examinations. Among that seventh we find a large proportion who are very determined about realizing their educational ambitions, not only for higher education generally but for a particular type and/or institution of higher education. Only a fifth of these students state that they would not become rōnin. All-in-all 11 percent of all the commerce and of all the technical-course graduates indicated that they definitely would or they might be rōnin.

Some oblique light may be shed on these findings by considering responses to a question in the Ministry of Education's 1968 survey of upper-secondary graduates. They asked those graduates of vocational curricula who expressed an explicit desire or intention to attend college or university for their reasons for that preference. The context of the questions seemed to be the presumption that students in vocational curricula would not anticipate further schooling unless the situation or their perceptions of options had changed, though this is not made explicit. The results were interesting from this point of view; 40 percent of the commerce and approximately a fourth of the agriculture and technical school students planning to continue with higher education stated that they had intended to go to college from the start. Unfortunately, the published results of the study are confounded both by the failure to separate the sexes and by inclusion of the above response on a par with other answers. Fortunately, however, the heaviest concentrations of girls so far as vocational schooling is concerned is

in domestic science courses, which are pulled out with an "other" category.

The quantitatively most important response in all except the commerce curricula was "to continue in my specialty," and even among the commerce students this took second place. The proportions of college-directed youth classified as giving this answer were: 32 percent among the commerce students, 42 percent among those in agriculture, and 46 percent in the technical course. The high percentage figure in the technical-school group accords well with the focussed emphasis of our sample of technical school students evidenced in a number of ways, including their concern to attain the higher technical careers for which further education of specific kinds is a prerequisite--a concern evidenced in the high proportions who definitely would be rōnin if necessary to attain their goals. But can we have this both ways? How, in this case, can we reconcile and interpret the still high 42 percent figure for "continuing in my specialty" among the agriculture students even though only 23 percent of the small college-directed group of agriculture students were ready definitely to contemplate a rōnin prospect? We suggest that even if we accept these findings for a very small sub-group in agriculture, the context and set of objective career options as related to the role of higher education and access to it are very different from those faced by the technical-course graduates.

The ambiguity involved in interpretation of the two responses thus far discussed suggests looking at them not only separately but also in combination. By so doing we get a maximum plausible estimate of continuity in specialization

through upper-secondary and into higher education. Those figures are 71 to 72 percent for the technical and the commerce students, 65 percent for the agricultural group. Reversals, "to change specialty," characterized a sixth of the commerce students and just over a fifth of the college-directed youth in the agriculture and the technical schools.

The extent and patterning of associations between college and rōnin attitudes and parental incomes of students in our 1966 samples are laid out in Table 4-18. Sons of farmers are again excluded. There is no evidence whatsoever of any immediate economic deterent effect discouraging the decision to become rōnin assuming higher education to be sought at all. Overall, the non-college students are unambiguously the category with lowest incomes, as we have seen in preceding tables. But most of the differences in income characteristics across rōnin attitude groups among the college-directed youth are negligible. The pattern taking all schools together is repeated in varying degree within each type of curriculum; in each instance it appears that perceived future cost and benefit advantages of attending the preferred institution neutralize or outweigh the extra costs of the intervening rōnin year for the poorest as often (or even more often) as for the comfortably situated students. The one case in which differences among rōnin attitude groups are substantial is for commerce sons of independent and family enterprisers. In that population the (few) youth saying that they definitely would be rōnin are decidely the poorest, with a median parental income of ¥607,000 and with 31 percent below ¥500,000

TABLE 4-18

PARENTAL INCOMES AND ATTITUDES WITH RESPECT TO BECOMING RONIN

Ronin Attitude and Type of Course	Non-Farm Fathers in Own or Family Enterprise: Net Incomes, 1966				Fathers in Wage and Salaried Employment Annual Earnings (Incl. Bonus) 1966			
	Number Reporting	Median Income (Thous. Yen)	Percentage with Incomes: Under 500,000 Yen	Over 1,500,000 Yen	Number Reporting	Median Income (Thous. Yen)	Percentage with Incomes Under 500,000 Yen	Over 1,000,000 Yen
All Courses:								
Not to College	560	685	29.8	14.3	1,195	536	30.2	8.2
To College:								
Ronin Yes	132	1,032	18.2	28.1	319	815	13.8	27.3
Ronin Uncertain	145	1,200	13.1	31.8	289	791	10.4	25.5
Ronin No	183	1,145	15.9	37.7	299	829	10.4	27.5
General (B+A) Course								
Not to College	58	660	31.0	13.8	95	612	35.8	8.5
To College:								
Ronin Yes	72	1,165	15.3	30.6	204	843	10.8	29.9
Ronin Uncertain	92	1,240	15.2	33.7	200	831	6.0	29.0
Ronin No	132	1,261	14.4	41.7	224	846	9.9	29.0
Commerce Course								
Not to College	180	692	27.8	16.2	258	547	26.8	7.4
To College:								
Ronin Yes	16	607	31.2	18.7	24	800	12.5	25.1
Ronin Uncertain	21	937	4.8	42.9	22	680	18.2	18.1
Ronin No	27	980	11.1	37.0	31	737	9.7	16 2
Technical Course								
Not to College	304	688	28.3	13.8	784	537	30.0	8.5
To College:								
Ronin Yes	42	950	19.1	19.1	89	758	19.1	22.4
Ronin Uncertain	31	1,135	12.9	19.4	76	759	18.4	14.5
Ronin No	21	950	23.8	19.0	44	720	15.9	27.2
Not to College:								
General B	15	900	26.7	33.3	33	672	27.3	12.1
General A	43	617	32.6	7.0	62	560	40.4	6.4
Agriculture	18	400	72.3	5.6	57	627	38.6	7.1

as compared with medians fifty percent higher and very small proportions below ¥500,000 among students stating that they are uncertain or they definitely would not take the rōnin route. The commerce sub-samples in this case are too small to place much weight on the statistical results, but those results are at least suggestive of an important contrast in the parameters of choice between the economically less and better situated sons of men in independent or family enterprises--both with respect to the impact of costs at private universities and the role of higher institutions in providing access to favorable career options.[1]

V. Income-Opportunity Perceptions and College Intentions

The modern theory of investment in human beings takes as its starting point an economic rationality assumption which when applied to the higher education decision, stipulates that (other things equal) the individual will invest in higher education if but only if at the relevant criterion or reservation[2] discount rate the present value of the expected future income stream associated with

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[1]The samples of college-going sons of non-farm enterprisers and employees enrolled in General A or in agricultural courses were too small to justify separate analysis. However, data for non-college students in agricultural schools and in the General B and General A courses separately are shown in the last three rows of Table 4-18. The most notable result is the marked income advantage of the General B non-college youth compared with the more rural General A and agriculture students, along with the very low level of incomes among independent non-farm fathers of youth attending agricultural secondary schools.

[2]See Valerien Harvey (1967), Chapter II.

higher education exceeds that associated with direct entry to the labor market from upper-secondary school. The former stream, for higher education, has negative values over the years of university study equal to direct outlays on schooling and schooling related expenses--but not those maintenanee costs that would go on regardless of a man's activity. "Foregone earnings" appear in the upper-secondary income stream; they are simply the early part of that earnings stream that is missed by attending college or university.

The "other things equal" qualification takes account, for example, of the occupational preferences and non-monetary satisfactions in the J_{iz} and J_{it} vectors of our formal model and also of π_{iz} and π_{it}. Ideally we would price these also and include them in the benefit-cost assessment. The criterion rate of discount is a function in part of family income and access to credit, as we have brought out in preceding discussions. That discount rate at which the present values of the two income streams being compared are equal is the "internal rate of return." When the criterion rate equals the internal rate the individual will be indifferent between continuing school or entering the labor market directly; if it exceeds the criterion rate college will be the route chosen, and conversely if the internal rate of return falls short of the criterion or reservation rate.[1]

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[1]There is an extensive technical literature on the "present value" versus the "rate-of-return" rule, but this need not concern us here. For most purposes these are complementary, not contradictory approaches, provided (and the proviso is critical) they are properly applied.

If this formulation is valid as a behavioral theory, it should be possible to find some supportive evidence in the perceptions and choices of persons at a critical decision point. But one of the first essential elements in such an empirical test must be to obtain an indicator of individual perceptions of future earnings streams to be expected with and without university education. Or to put this more pointedly, the critical question is concerned with perceived differences between the university and non-university earnings streams, whatever their respective levels. But people are very hesitant to give direct answers to an open-ended question about their income expectations for the obvious reason that such expectations are never single-valued and articulation of probabilities or surprise boundaries[1] may be almost as difficult as specification of the parameters of a driver's decision as to when to pass a car on the highway. These difficulties are avoided in large measure by posing income anticipation questions in a form that directs the respondent to select the most likely category from a set of income classes. This is the way in which we proceeded. Respondents were asked to check the income class best indicating their expectations for the first and fifth years in the labor market and for peak earnings; they did this twice, first assuming no further schooling and then assuming graduation from university. This gave us a set of six answers from each respondent. In analyzing the results

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[1] On these concepts and some of their applications, see the papers by various authors in Bowman, 1958.

we retained the initial categorical classification for some purposes, but in the main we converted the data into cardinal variables by interpolating class mid-points from logit transforms on three/merged distributions: for the year 1, year 5 and peak-year anticipations. The full analysis of anticipated life-income paths is deferred to Chapter VI, however. Here we do three things. First we look briefly at the two distributions of responses with regard to peak incomes as perceived by students in the various types of upper-secondary schools. (This analysis disregards the students' college intentions or lack thereof.) We then examine the role of college intentions and parental income (alone and controlling for other variables) in determination of the individual's own peak income anticipation. Third and finally, we examine mean entry-job and peak income estimates by classroom units for college-directed and non-college youth.

Distributions of Perceived Peak Monthly Earnings

Responses with respect to anticipated peak monthly earnings with and without university education are shown as cumulative distributions in Figure 4-2 and summarized in Table 4-19. On Figure 4-2 the vertical axis is a probability or probit scale in which distances are marked off in standard deviation units on a normal distribution. The horizontal axis is in logarithmic form. The curves shown are cumulative percentages of students in each course type who responded with peak income expectations above the designated levels assuming no further schooling (the dashed lines) and assuming university education (the solid lines).

Fig. 4-2

Cumulative Distributions of Predicted Peak Monthly Incomes
(Percentages above Designated Levels)

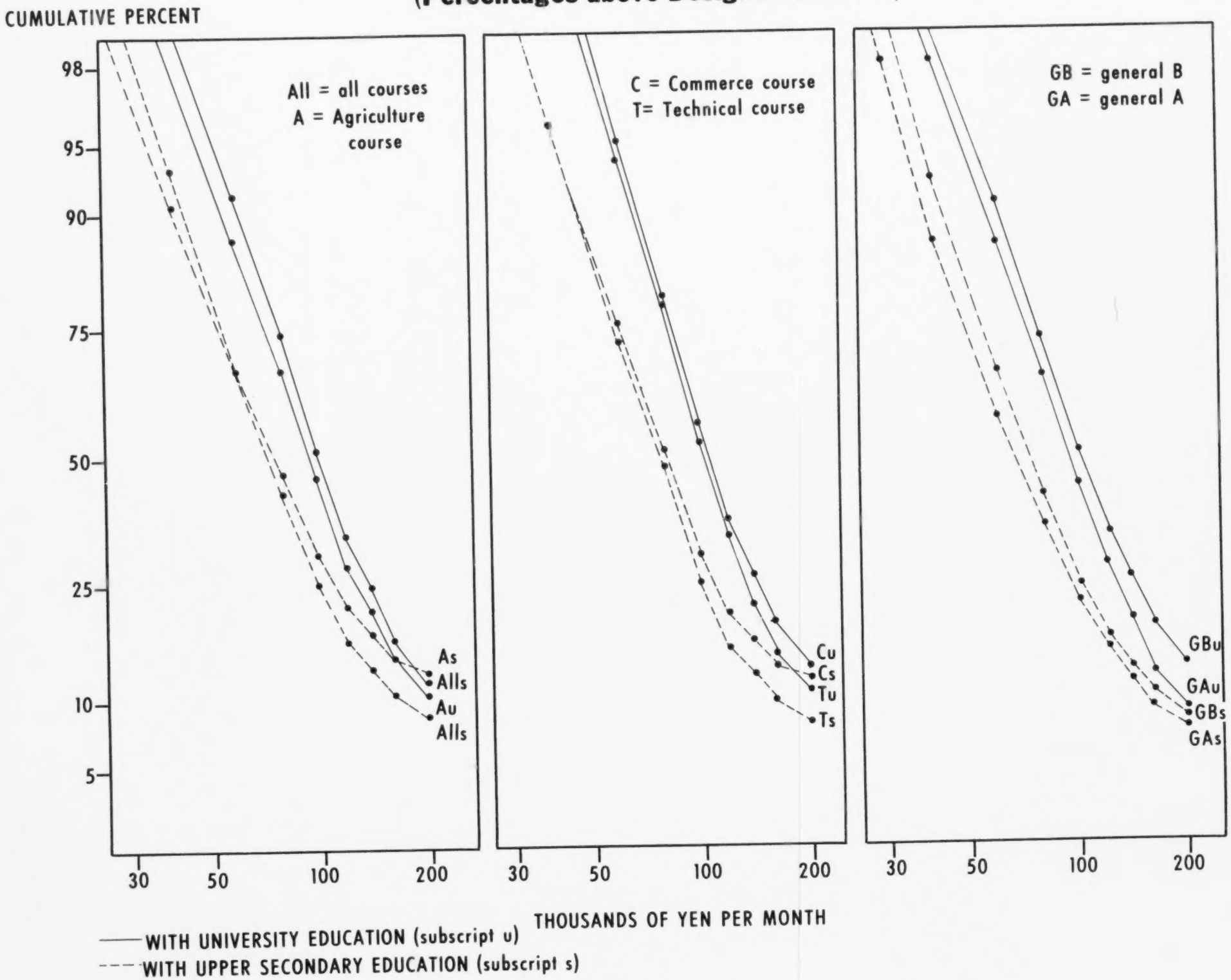


TABLE 4-19

SUMMARY ANALYSIS OF PREDICTED PEAK MONTHLY INCOMES (YL) WITH AND WITHOUT UNIVERSITY EDUCATION BY TYPE OF UPPER-SECONDARY COURSE

	General B	General A	Agriculture	Commerce	Technical	All Students (Adjusted Sample)
YLU (Thous. Yen)[a]						
Top 25th Percentile	140	125	125	145	135	140
Median	98	92	97	107	103	103
75th Percentile	77	70	73	85	83	80
YLS (Thous. Yen)[a]						
Top 25th Percentile	98	92	115	110	102	103
Median	72	65	76	82	77	74
75th Percentile	53	47	55	61	59	55
YLU-YLS (Thous. Yen)						
At 25th Percentile	42	33	13	35	33	37
At Medians	26	27	21	25	26	29
At 75th Percentile	24	23	19	24	24	25
YLU/YLS						
At 25th Percentile	1.43	1.36	1.11	1.32	1.32	1.36
At Medians	1.36	1.42	1.28	1.30	1.34	1.39
At 75th Percentile	1.45	1.49	1.35	1.39	1.41	1.42
Percentages Above ¥200,000						
YLU	13	8	11	12	13	12
YLS	8	8	13	8	11	9
YLU-YLS	5	-	-2	4	2	3
Percentages Below ¥50,000						
YLU	4	6	7	2	11	3
YLS	20	28	20	14	15	19
YLU-YLS	-16	-22	-13	-12	-4	-16
Own Peak Income Expectations[b]						
Arith. Mean (Thous. Yen)	115	87	102	100	94	103
Geom. Mean (Thous. Yen)	110	73	86	86	82	89
Coefficient of Variation	1.86	1.50	1.56	1.62	1.73	1.72
Arith. mean/Geom. mean	1.05	1.19	1.18	1.16	1.15	1.15

[a]YLU = Prediction assuming university education. YLS = Prediction assuming no education beyond secondary school.

[b]Taking the response on YLU or YLS according to whether the respondent is respectively taking or not taking examinations for higher education.

The "All" curve is from the adjusted sample, in which proportions in each type of curriculum match the actual distribution among curricula in Japan as of 1966. A straight line in these distributions would be a logarithmically normal distribution; the steeper the slope of that line the less the dispersion in responses weighted logarithmically. We used three panels simply because differences among course types were too small to spread the curves out sufficiently to maintain their separate visual readability. Table 4-19 does part of the curve reading for us, by taking the median and quartile positions of all curves and laying them out in summary form.

Certain key features of these distributions are immediately evident from even the most casual inspection of Figure 4-2. First, differences between the expected college and non-college peak earnings are generally much greater than differences among courses but within the college or the non-college category at all probit levels (or cumulative percentages) excepting the upper segments of the distributions. This is evident by comparisons of distances between the solid and between the dashed lines as compared with differences between a solid and its corresponding dashed curve. Second, in all cases the distributions approximate closely to a log-normal form except, again, at the top, where some tail out (are distinctly skewed) even in logarithmic terms. That tailing or skewness is especially noticeable for the non-college distributions among the agriculture and commerce students. Also, as Table 4-19 shows, the commerce students were overall the most optimistic in their peak income assessments when those

perceptions were specified according to post-secondary education. The most modest anticipations, with or without university education, were those expressed by students in the General A curricula.

Differences between the university and non-university income peaks anticipated by students in each curriculum are summarized in two ways in Table 4-19: according to absolute differences at the medians and the upper and lower quartile breaks and according to income ratios at those same positions. In terms of the absolute differences, the agriculture students generally distinguished much less between university and non-university expected incomes than did students in other courses, and the General B students gave the university option the biggest edge in the upper 25th percentile of the distribution. Otherwise the patterns in absolute differences were very much the same from one curriculum to another, with differentials ranging from around ¥ 24,000 at the low quartile to around ¥ 34,000 at the upper quartile position. In ratio terms this is reversed (except for General B), the highest ratios in each case being at the lower ranges of the distributions--as is apparent also in Figure 4-2.

The last block of entries in Table 4-19 differs from all others in that it refers to the peak income estimate applicable to the individual in terms of his college expectations. Thus if a youth was taking entrance examinations the response used for him was his estimate for university men; if he was not taking examinations the response was for non-college men. This explains why the General B students are the highest in both arithmetic and geometric mean

"own peak income expectations," even though commerce and technical students had higher medians for both the university and the non-college estimates as given by all students regardless of their anticipations with respect to their own further education. General B students were the most spread out in their own peak income expectations if we measure relative dispersion by the coefficient of variation, but their distribution is also the one with the lowest skewness--as is shown by the low ratio of arithmetic to geometric mean. (All the distributions were characterized by some positive skew, whether we look at "own peak income expectations" or at responses specified for university or non-university situations, and regardless of type of curriculum or students' own college plans.)

Own expectations are shown in Table 4·20 by curriculum and preferred peak employment status. In this table we have used geometric means. Several generalizations can be made from these data. First, within each preferred employment status the General B students had the highest income expectations, though commerce students were in virtually the same position as General B students among those preferring government employment. Second, regardless of curriculum youth expressing a preference for independent employment or employment in a family enterprise expected significantly higher peak earnings on the average than did those in any other category. Third, the next most lucrative sort of employment in the anticipations of these youth was in big private enterprises. Those looking forward to employment in government or in small private firms anticipated the lowest peak earnings. The most surprising

figure in the table, given the general pattern, is the comparatively high peak incomes anticipated by General B students looking to employment in small firms as compared with employment in government--or with other students preferring the smaller employers.[1]

TABLE 4-20

EXPECTED OWN PEAK MONTHLY INCOME BY PREFERENCE WITH RESPECT TO PEAK EMPLOYMENT STATUS AND TYPE OF UPPER-SECONDARY COURSE[a]

Preferred Peak Employment Status	Course Type					
	All (Adjusted Sample)	General B	General A	Agri-culture	Com-merce	Tech-nical
	(Geometric Means in Thousand Yen)					
Independent Family	100	113	87	98	104	93
Employee:						
Government	74	79	64	72	78	73
Big Corporation	91	106	77	78	83	85
Small Firm	77	96	67	70	75	77

With these patterns in mind, we are in a position to compare the students' estimates of peak earnings prospects with monthly incomes reported by employee fathers and with data from published wage surveys. Overall, the students

[1] General B students expressing no employment status preference anticipated peak incomes close to the General B students preferring independent or family activities.

anticipated peak monthly incomes higher than the 1966 monthly cash incomes of wage and salary workers in private enterprise in their peak earnings years. The median estimate made by students for university men, at ¥ 103,000 per month (last column of Table 4-19) exceeded monthly cash earnings of university men aged 50 in private employment in 1966 by about 15 percent. But a 15 percent difference is a very modest one to account for bonus receipts, which were almost certainly more than that. There is no evidence of any built-in assumptions of secular growth in incomes of university men over the future. The median estimates made by students for the peak monthly earnings of graduates of upper-secondary schools exceeded the 1966 peak-age monthly cash earnings of such men by almost 25 percent, while the bonus adjustment for these men should be smaller rather than greater than that for the university graduates. The result is an estimated ratio of median university to upper-secondary earnings in the student anticipations of 1.39 compared with a figure, even making no bonus allowance, of 1.48 derived from the published wage and salary data. But there are several things that enter into these findings, two of which may be especially important: The students are not a random sample of Japanese youth, and in particular sons of men with upper-secondary schooling will be less fully represented in our sample (and more selected income-wise) than sons of university men. And these expressions of anticipated peak monthly incomes are not confined to wage employment; they include those anticipating independent or family enterprise, with the highest projected peak earnings.

On the average students' perceived income peaks for the future were in fact remarkably close to earnings reported by the wage and salaried men among their fathers. The 1966 incomes reported by employee fathers with university education averaged ¥1,270,000 in Tokyo and Osaka and ¥1,200,000 elsewhere in our samples. Dividing by twelve to put these figures on a monthly basis, we have ¥106,000 and ¥100,000 per month, as compared with median students' estimates of peak earnings for university graduates of ¥103,000 (shown in the last column of Table 4-19). The correspondence for average incomes of fathers with upper-secondary education and students' median estimates of future peak incomes of men with upper-secondary schooling was equally close.[1]

Determinants of Peak Income Anticipations

Regressions taking students' expected own peak monthly incomes as the dependent variable were carried out taking the income expectations in both raw and logarithmic form. The latter gave slightly better results. Since our main interest here is in the marginal affects of college anticipations and of parental incomes on these income anticipations controlling for other factors (such as father's education and occupation, location, etc.), we have elected

[1] For fathers aged 50 in Tokyo and Osaka it was ¥950,000 a year or ¥79,000 a month compared with school geometric means of ¥81,000 a month in the urban areas. For other fathers it was ¥73,000 a month compared with a rural student estimate of the same amount. Since these geographic classifications are not quite matched, the student estimates are somewhat the higher, but not substantially so.

to present summaries focussing on those relationships and limited to equations in which the dependent variable took the logarithmic form. These summaries (Tables 4-21 and 4-22) are presented for each curriculum separately and also for the adjusted sample with all curricula taken together; in the latter analysis we distinguish equations with and without a dummy set of independent variables for course type.

Zero-order correlations between EXAM (the dummy variable taking or not taking examinations for entry to institutions of higher education) and YL were positive and in most instances statistically significant among both the sons of employee fathers and of fathers in independent (or family) business or professional practice, although the proportion of variance explained was low, ranging from a low of 2 percent to a high of 10 percent if we exclude the small sample of 26 sons of self-employed in the agricultural course (with an r of .522 and a coefficient of determination of .272). These are maximal estimates of affects of college anticipations on (or associations with) peak income anticipations. In a zero-order relationship EXAM is picking up family background and location effects that bias the coefficients upward. The entries in the lower sections of Table 4-21 show partial correlations between EXAM and YL and regression coefficients on EXAM controlling for backgrounds in education of parents and grandfather, father's occupation, classroom composition and the location indicators SLOW-50 and FREQ-M without and then with inclusion among independent variables of parental income as reported by students' fathers.

TABLE 4-21

EXPECTED FUTURE PEAK MONTHLY INCOMES (YL), UNIVARIATE STATISTICS AND ASSOCIATIONS WITH COLLEGE PLANS (EXAM) BY COURSE IN WHICH ENROLLED; SONS OF EMPLOYEES AND OF MEN IN INDEPENDENT PRACTICE OR FAMILY BUSINESS (EXCLUDING FARMERS)

	All Courses		Course Type				
	(a)	(b)	General B	General A	Agriculture	Commerce	Technical
Number of Students:							
All Students, Adjusted Sample[c]	4,290		1,768	526	337	675	984
Sons of Employees[d]	2,083		620	82	58	336	987
Sons of Self-employed[d]	1,006		300	49	26	242	389
Mean of YL, All Students (Adjusted Sample)	103		115	87	102	100	94
Standard Deviation of YL, All Students (Adjusted Sample)	61		62	58	65	62	55
Mean of Log YL							
All Students, Adjusted Sample	1.950		2.042	1.866	1.933	1.934	1.916
Sons of Employees	1.944		2.018	1.865	1.829	1.931	1.916
Sons of Self-employed	1.992		2.045	1.920	1.896	1.979	1.976
Standard Deviation of Log YL							
All Students, Adjusted Sample	.228		.217	.238	.249	.226	.211
Sons of Employees	.226		.220	.236	.195	.229	.217
Sons of Self-employed	.251		.237	.269	.230	.275	.239
Zero-order Correlation between EXAM and Log YL							
Sons of Employees	.319		.203	.339	.132	.337	.226
Sons of Self-employed	.259		.154	.273	.522	.221	.270
Partial Correlations of EXAM with Log YL (Log YL Dependent)							
Sons of Employees							
(1) In full equations except father's earnings[e]	.215	.246	.141	.376	.212	.305	.209
(2) In full equations including father's earnings (with bonus)[e]	.207	.236	.137	.354	.224	.299	.201
Sons of Self-employed							
(1) In full equations except parental net income[e]	.199	.157	.114	-.299	...	.128	.266
(2) In full equations including parental net income[e]	.195	.154	.114	-.427	...	.121	.272
Regression Coefficients on EXAM (Log YL Dependent)							
Sons of Employees							
(1) In full equations except father's earnings[e]	.1419***	.1257***	.1247**	.2419*	.3525	.1879***	.1276***
(2) In full equations including father's earnings (with bonus)[e]	.1367***	.1206***	.1204**	.2260*	.3707	.1866***	.1228***
Sons of Self-employed							
(1) In full equations except parental net income[e]	.1434***	.0976***	.1300	-.4933	...	.0873	.1776***
(2) In full equations including parental net income[e]	.1410***	.0959***	.1295	-.8615	...	.0839	.1819***

[a] Regressions including course types as a set of independent variables.

[b] Regressions excluding course types as independent variables.

[c] Sample drawn by random numbers to give distribution among course types matching that for all Japan

[d] Matched father-son samples excluding cases on which responses concerning parental earnings or income were incomplete

[e] For specification of variables in these equations see Appendix.

In the first column, which refers to all schools and to regressions that include the dummy set on course type, EXAM predicts almost as well for the sons of the "self-employed" as for sons of employees. However, eliminating the course-type dummies raises the partial correlation and regression coefficients on EXAM for the sons of employees while lowering it for sons of independent or family enterprisers. Some of the reasons for this asymmetry are evident in the results of regressions within course types.

The results for General B are the least interesting and the most readily predictable. Since the vast majority of the General B students anticipate further education it would be surprising indeed if EXAM could explain any major part of the variance in their peak income anticipations, whatever their parental employment status (i.e., as salaried men or men in independent and family business or professional practice). Looking just at sons of employees, the results for the other course types hold no great surprises. All coefficients are positive as we had anticipated and the partial correlation coefficients on EXAM are higher among the General A students than in any other category, which is also in accord with what we had expected a priori given other characteristics of that student population. Also, for sons of employees all the regression coefficients are significant to at least the .05 probability level and among the students in the commerce and technical curricula to the .001 level. But the results for sons of self-employed are very different in their pattern. The only course type within which we find EXAM to carry significant regression coefficients

for sons of the self-employed is the technical curriculum, where EXAM comes through with as much strength in the multiple as in the zero-order regressions. The coefficients on EXAM in the commerce course do not deviate significantly from zero despite the fact that this was one of the larger sub-samples. But most startling, even though not statistically significant, are the high negative coefficients on EXAM among the General A students. Here (as among commerce students) once again the results are confounded by the complex relationships between educational ambitions and opportunities (or pressures) relating to family enterprise and immediate participation therein after graduation from upper-secondary institutions.

Once other parental background variables were introduced in the equations, addition of an independent variable for parental income reduced the coefficients on EXAM very little, and in some instances not at all. But this does not say anything about how far parental incomes may nevertheless have influenced student perceptions of peak monthly earnings they might anticipate given their anticipations with respect to higher education or direct entry into the labor market (or the family enterprise). Table 4-22 is directed to that question. It is immediately obvious that parental incomes were considerably less important as predictors of student income anticipations than were responses on EXAM, and especially among sons of the "self-employed" fathers. Even among sons of employees the only significant regressions were those for all schools taken together, for students in the General B curriculum and for students in technical

TABLE 4-22

EXPECTED FUTURE PEAK MONTHLY INCOME (YL): ASSOCIATION WITH PARENTAL INCOMES BY COURSE IN WHICH ENROLLED; SONS OF EMPLOYEES AND OF SELF-EMPLOYED

	All Courses (a)	All Courses (b)	General B	General A	Agri-culture	Com-merce	Tech-nical
Number of Students in Sample	2,083		620	82	58	336	987
Sons of Employees	1,006		300	49	26	242	389
Sons of Self-employed (Non-farm)							
Father's Annual Earnings (with Bonus) as an Independent Variable Against Log YL; Sub-sample of Sons of Employees							
Zero-order Correlation with Log YL	.187		.185	.363	.180	.098	.129
Partial Correlation with Log YL							
(2) In full equations (including EXAM)	.087**	.088**	.107*	.152	-.154	.018	.173
(3) In equations with family traits only	.111***	.123***	.130**	.158	-.251	.095	.104**
Parental Net Income as an Independent Variable Against Log YL; Subsample of Sons of Self-employed							
Zero-order Correlation with Log YL	.101		.074	264	-.076	.137	.066
Partial Correlation with Log YL							
(2) In full equations (including EXAM)	.041	.044	.018	-.330		.028	.087
(3) In equations with family traits only	.053	.050	.004	-.238		.025	.055
(4) In equation with type of course only	.093*	---	---	---	---	---	---

courses when, but only when, EXAM was not included among the independent variables. It seems evident that family income influences income anticipations, even among sons of employees, primarily via allocations into one or another upper-secondary curriculum and through the financing of higher education. Among sons of the self-employed, large errors almost certainly present in reported parental net incomes bias the coefficients on those incomes toward zero, concealing the influences evidenced in other parts of our analysis with respect to prospects in association with family enterprises.

Group Data, Income Anticipations and the Higher Education Decision

As a step toward a simplified summary expected-benefit-cost assessment of the higher education decision, we turned to data by group or class units, treating as separate "classes" or "classrooms" all students in our sample for a particular school who reported taking the examination and all those reporting that they were not doing so. Thus in most cases we had two "classrooms" per school, although some school samples provided only one "classroom" unit because students reporting they were or conversely those reporting they were not taking examinations were too few to justify use of a group mean.

The scattergrams in Figures 4-3 and 4-4, which are drawn from the same data base as Table 4-23, compare school by school the perceptions of peak monthly earnings of university men as seen by those students taking examinations (on the vertical scale) and by those not taking examinations (on the horizontal

scale). Urban schools are shown at the left, rural at the right, and in both cases symbols indicate the type of school involved. Entries above (to the left) of the diagonal are those in which the college-directed students averaged higher than non-college students in their estimates of peak earnings of university men, and conversely for those below (to the right) of the diagonal. It is easy to observe from these charts also how far mean income expectations of these two categories of students within the same schools were associated. Generally the association was evidently very slight with the exception of the technical-school students, where a positive association is indicated. Among the urban general students (who were predominantly General B) there was very little relative variation among school means in the income anticipations of those expecting to continue with higher education, but a wide inter-school variation in these estimates appears among students not taking examinations. In all cases the technical-school observations and in most cases those for the urban general schools lie where we might expect them, other things equal; that is, they are above the diagonal, the college-directed youth estimating higher peak incomes for university men than were estimated by their classmates who were not seeking further education. Among the commerce students, on the other hand, there is no relationship of this sort, nor do we find any such pattern in the rural general schools. The one rural commerce course sample with enough students in both categories to include in this analysis, like one of the urban commerce schools, lies far above the diagonal even though it is high also on the horizontal axis.

TABLE 4 23

STUDENT ASSESSMENTS OF FUTURE PEAK MONTHLY INCOMES (YL) WITH AND WITHOUT HIGHER EDUCATION. ANALYSIS OF SCHOOL MEANS CLASSIFYING STUDENTS BY EXPECTED COLLEGE OR DIRECT LABOR MARKET DESTINATIONS

	Number of Schools Included[a]	Mean of School Means in Estimated Log (YL)[b] for Men with:		Mean of School Differences in Mean Log (YL) for Higher Minus for Secondary Education	Range in School Differences between Higher and Secondary Education Estimates	
		Higher Education	Secondary Education		Lowest	Highest
STUDENTS TAKING EXAMINATIONS						
All Students						
Individual Weighting[c]	63	2.0410	1.9087	.1323	...	...
School Weighting	54	2.0383	1.9109	.1274	0485	.3067
School Types: All Locations						
General	26	2.0047	1.8636	.1411	.0610	.2909
Commercial	9	2.0920	1.9983	.1020	.0485	.2303
Technical	11	2.0656	1.9480	.1181	0805	2372
Agricultural	5	2.0483	1.9834	.0648	0378	.0993
Combined[d]	3	2.0137	1.8126	.1565	.1124	3067
School Types: Urban						
General	12	2.0502	1.9060	.1442	.0926	1947
Commercial	8	2.0807	1.9765	1043	.0485	.2303
Technical	11	2.0656	1.9480	.1181	.0805	.2372
Agricultural	2	1.9574	1.8887	0688	0382	.0993
School Types: Rural						
General	14	1.9657	1.8273	.1384	.0610	.2909
Commercial	1	2.3154	2.2383	.0771		
Agricultural	3	2.1088	2.0466	.0622	.0378	.0779
Combined	3	2.0137	1.8126	.1565	.1124	3067
STUDENTS ENTERING LABOR MARKET DIRECTLY						
All Students						
Individual Weighting[c]	63	2.0171	1.9047	.1124		
School Weighting	58	1.9912	1.8904	.1008	.0405	.1753
School Types: All Locations						
General	22	1.9519	1.8622	.0907	.0405	.1753
Commercial	13	2.0371	1.9239	.1131	.0193	1728
Technical	11	2.0297	1.9058	.1239	.1100	.1552
Agricultural	5	1.9965	1.9270	.0696	0273	.0958
Combined[d]	7	1.9822	1.8786	1030	.0157	1461
School Types: Urban						
General	8	1.9429	1.8988	.0462	-.0405	.1740
Commercial	11	2.0382	1.9289	.1093	- 0193	1728
Technical	11	2.0297	1.9058	.1239	.1100	.1552
Agricultural	2	1.9938	1.9084	.0855	.0751	.0958
School Types: Rural						
General	14	1.9589	1.8334	.1256	0563	1753
Commercial	2	2.0309	1.8965	.1344	.1277	1411
Agricultural	3	1.9984	1.9394	.0589	.0273	.0876
Combined	7	1.9822	1.8786	.1030	0157	1461

[a] Excepting the rows with individual weighting, figures in this column exclude schools in which the number of students in the relevant categories (taking examinations or entering the labor market directly, as the case may be) and responding on the earnings estimates numbered five or less.

[b] Logarithms of incomes in thousand-yen units. Thus the true mean log (YL) at the top of column (2), for example, is 2.0410 + 3, or 5.0410.

[c] These entries refer to the unweighted aggregates of all students responding, not to the means of school means.

[d] Schools including two distinct courses, usually general A and agriculture. All are rural. (Presence of both general B and general A course programs does not constitute a "combined" school.)

Fig. 4-3

Student Perceptions of Prospective Peak Monthly Earnings of Male University Graduates

STUDENTS IN:
- • General Schools
- A Agricultural and Combined Schools
- C Commerce Schools
- X Technical Schools

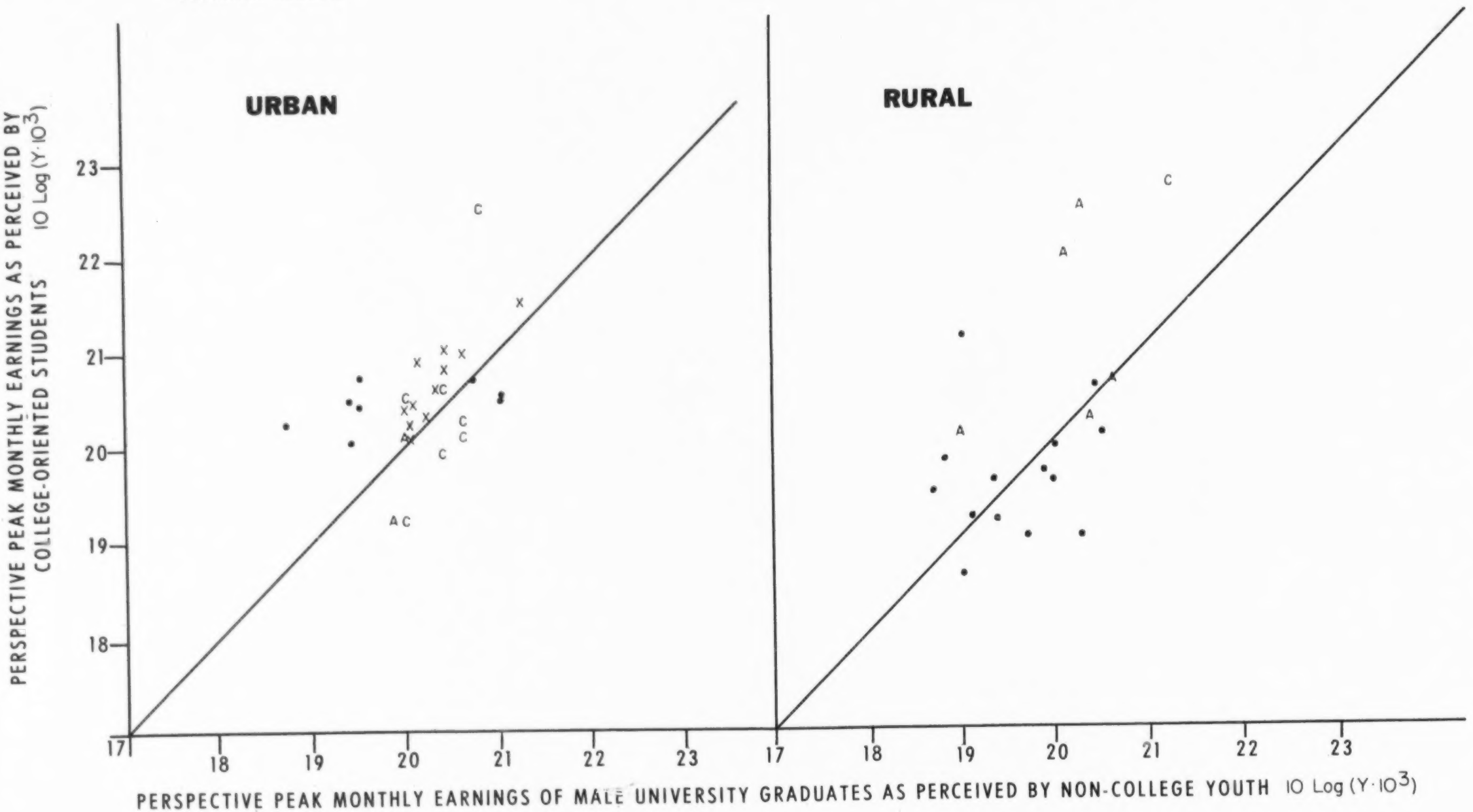
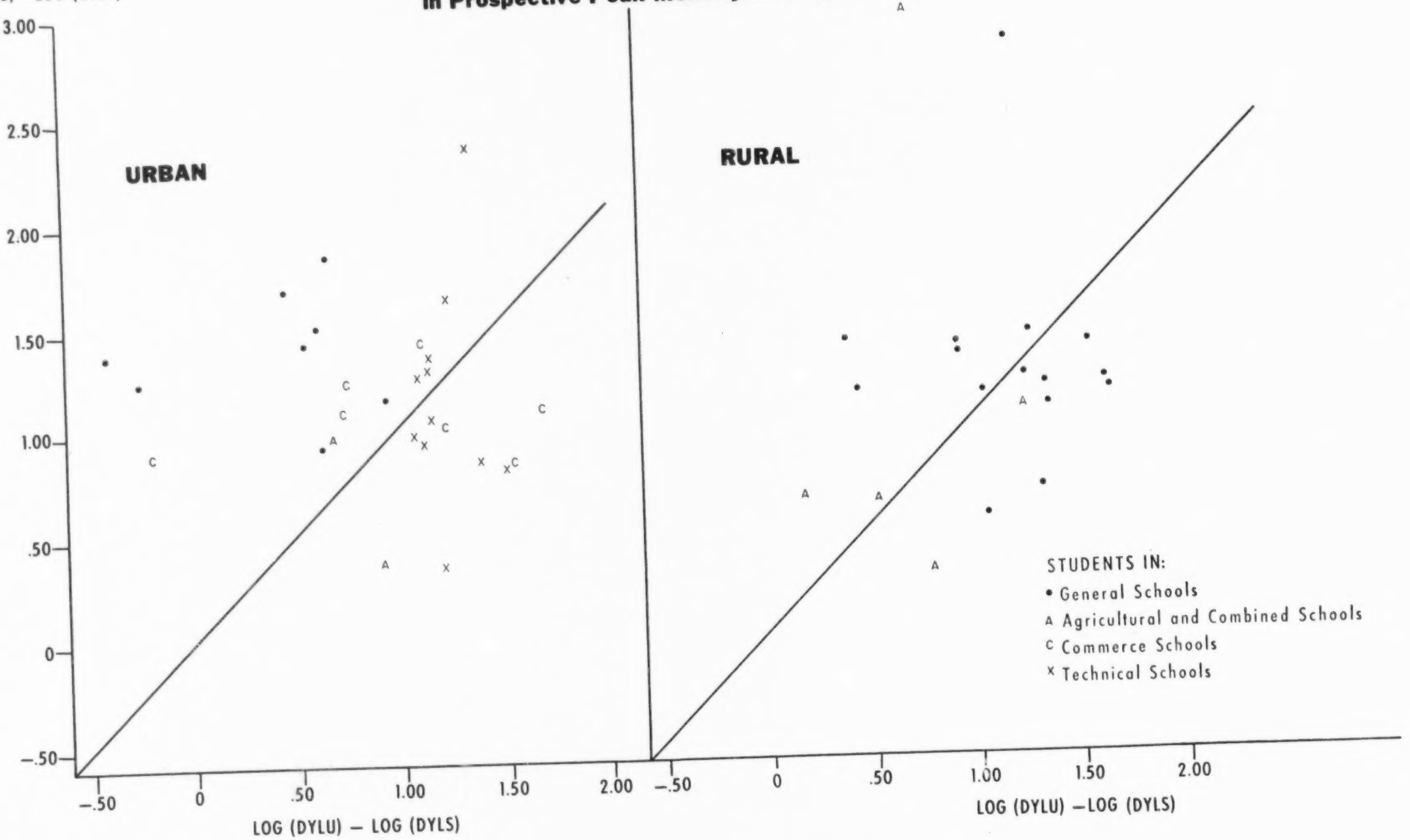


Fig. 4-4

Student Perceptions of College/Non-college Differentials in Prospective Peak Monthly Earnings



Also striking is the contrast between college-directed and other students in three of the five agricultural schools; but it must be remembered that the numbers and proportions of agriculture students taking examinations are small.

What these perceptions may mean for the expectational economics of the higher education decision depends, among other things, on whether high estimates for peak earnings of university people are accompanied by correspondingly high estimates for peak earnings of men with upper-secondary schooling only, and vice versa. Figure 4-4 expresses these differences in relative terms, as the difference between the mean logarithm of estimated YLU and estimated YLS where YLU is the estimated peak income of men with university education and YLS is the estimated peak of men with upper-secondary schooling. Again the means for student groups taking examinations are plotted on the vertical, those for non-college groups on the horizontal axis. Looking first at the panel to the left, two striking contrasts with Figure 4-3 are immediately evident. All general students are now above the diagonal line; without exception the urban general students taking examinations averaged higher ratios of estimated university to secondary peak earnings options than did students not taking examinations. On the other hand, the technical-school students spread out above and below the diagonal, with widely diverging ratios in the responses of those taking examinations but a narrow range of these relative assessments among students anticipating direct entry to the labor market. Commerce students reverse the pattern among the technical-school students in that the

variations in relative assessments seem to be greater across schools for those who are not taking examinations rather than for those who are doing so. These patterns are entirely consistent with both the complexities introduced by family enterprises, affecting especially the non-college commerce students, and the kinds of job options visualized by technical as compared with general students (to which we will come in Chapters V and VI). Among the rural youth, on the other hand, there is no systematic pattern at all. If those rural youth who entertain ambitions for higher education are distinguished from the rest of the rural students in their economic assessments of the implications of that choice it must be on account of other dimensions of the economic prospects than estimates of future peak incomes resulting from one option relative to the other.

Clearly one of these other considerations must be immediate earnings foregone. Student perceptions of those foregone earnings are summarized for the same grouped observations in Table 4-24. Responses are tightly clustered, with somewhat higher figures on foregone earnings perceived by the college-directed youth, both urban and rural. The differences are greatest in a few of the urban general schools, where the non-college students averaged exceptionally low in their estimates of direct-entry wages, and in three rural agricultural schools where the college-directed students specified exceptionally high estimates of potential earnings in a first job from upper-secondary school. There is very little difference between the urban and rural students in the general levels of responses, but the close-clustering on estimates for job-entry wages compared

TABLE 4.24

STUDENT PERCEPTIONS OF MONTHLY EARNINGS POTENTIALS IN ENTRY JOBS FROM SENIOR SECONDARY SCHOOLS. ANALYSIS OF SCHOOL MEANS CLASSIFYING STUDENTS BY EXPECTED COLLEGE OR DIRECT LABOR MARKET DESTINATIONS

	All School Types	Types of Schools				
		General	Commerce	Technical	Agriculture	Combined Schools[a]
ALL STUDENTS						
Schools in All Locations						
Means of School Means	1.2067	1.2134	1.1928	1.2002	1.2170	1.2019
Lowest School Mean	1.1591	1.1779	1.1588	1.1869	1.1834	1.1873
Highest School Mean	1.2926	1.2552	1.2926	1.2122	1.2827	1.2347
Urban Schools						
Means of School Means	1.2081	1.2296	1.1941	1.2002	1.1880	---
Lowest School Mean	1.1591	1.2077	1.1588	1.1869	1.1834	---
Highest School Mean	1.2926	1.2552	1.2926	1.2122	1.1927	---
Rural Schools						
Means of School Means	1.2027	1.1984	1.1851	---	1.2365	1.2019
Lowest School Mean	1.1761	1.1779	1.1761	---	1.2087	1.1873
Highest School Mean	1.2827	1.2214	1.1942	---	1.2827	1.2347
STUDENTS TAKING EXAMINATIONS (C)						
Schools in All Locations						
Means of School Means	1.2262	1.2203	1.2161	1.2161	1.2448	1.1503
Lowest School Mean	.9031	1.1761	1.1761	1.1847	1.1761	.9031
Highest School Mean	1.3203	1.2572	1.3203	1.2380	1.2905	1.2636
Urban Schools						
Means of School Means	1.2226	1.2347	1.2169	1.2161	1.2172	---
Lowest School Mean	1.1761	1.2155	1.1761	1.1847	1.1844	---
Highest School Mean	1.3203	1.2512	1.3203	1.2380	1.2499	---
Rural Schools						
Means of School Means	1.2004	1.2080	1.2070	---	1.2632	1.1503
Lowest School Mean	.9031	1.1761	1.2070	---	1.2178	.9031
Highest School Mean	1.2905	1.2419	1.2070	---	1.2905	1.2636
STUDENTS ENTERING LABOR MARKET DIRECTLY (LM)						
Schools in All Locations						
Means of School Means	1.1974	1.1860	1.1897	1.1971	1.2161	1.2014
Lowest School Mean	1.0851	1.0851	1.1411	1.1887	1.1809	1.1786
Highest School Mean	1.2899	1.2503	1.2534	1.2091	1.2899	1.2353
Urban Schools						
Means of School Means	1.1904	1.1836	1.1907	1.1971	1.1884	---
Lowest School Mean	1.0851	1.0851	1.1411	1.1887	1.1809	---
Highest School Mean	1.2534	1.2380	1.2534	1.2091	1.1959	---
Rural Schools						
Means of School Means	1.1967	1.1880	1.1843	---	1.2346	1.2014
Lowest School Mean	1.0851	1.0851	1.1761	---	1.2030	1.1786
Highest School Mean	1.2899	1.2503	1.1924	---	1.2899	1.2353
STUDENTS (C) minus STUDENTS (LM) MEAN ESTIMATES[b]						
Schools in All Locations	.0288	.0343	.0264	.0190	.0287	-.0511
Urban Schools	.0322	.0511	.0262	.0190	.0288	---
Rural Schools	.0037	.0200	.0227	---	.0286	-.0511

[a] Schools including two distinct courses, usually general A and agriculture. All are rural. (Presence of both general B and general A course programs does not constitute a "combined" school.)

[b] Means of school means for students taking examinations minus means of school means for students entering the labor market directly.

with the spreads on peak earnings estimates (even when we take school means rather than individual observations as the basis for our analysis) leaves patterns of net benefits much as those shown for peak earnings, albeit with the college, non-college differentials slightly damped.

Pulling all this together we present overall averages in Table 4-25, giving each group observation a weight of one. The upper part of the table shows clearly enough that youth taking and those not taking examinations differ substantially in their estimates of relative peak incomes for college and non-college men when they are attending urban general schools, the contrast is still notable among the urban commerce students and among agriculture students in rural "combined schools," as it is--notably--when we look at all rural schools togetner. Otherwise, however, contrasts are far from impressive. Nor does the evidence for a narrowly economic rationale in the higher education decision change with the inclusion of perceived foregone earnings in the "university-advantage indexes" in the lower part of Table 4-25. As a behavioral hypothesis, the simplified economic model stands up very well with respect to urban general course students and finds considerable support in the urban commerce and the rural combined-school samples. It says nothing at all with respect to students in the technical curricula and is actually reversed (for special and understandable reasons) among students in the urban agricultural secondary schools.

TABLE 4-25

SUMMARY INDICATORS OF THE ECONOMIC ASSESSMENT OF THE UNIVERSITY OPTIONS BY COLLEGE-DIRECTED AND NON-COLLEGE STUDENTS, URBAN AND RURAL GROUPS BY UPPER-SECONDARY SCHOOLS

	Urban Students		Rural Students	
	Taking Exams	Non-College	Taking Exams	Non-College
I. $\bar{G}$ (YLU-YLS)[a]				
All Students	27	20	28	12
Students in (school or course):				
General (B and A)	31	9	25	23
Commerce	25	14	34	28
Technical	27	26	...	...
Agriculture, independent	14	17	16	13
Agriculture, in combined school	...	...	38	20
II. University-Advantage Indexes[b]				
All Students	4.04	3.23	4.40	1.91
Students in (school or course):				
General (B and A)	4.49	1.48	3.88	3.57
Commerce	3.79	2.26	5.28	4.58
Technical	4.12	4.14	...	...
Agriculture, independent	2.12	2.76	2.19	1.89
Agriculture, in combined school	...	...	6.74	3.14

[a]Where $\bar{G}$ refers to the geometric means and YLU and YLS specify predicted peak monthly incomes respectively with and without university education.

[b]$10 \cdot \bar{G}\,(YLU-YLS)/4 \cdot YIS$ where YIS refers to predicted monthly earnings at first job on direct entry to the labor market from upper-secondary school.

VI. Group Observations and Simultaneity in the Stage I - Stage II Educational Decisions

That decisions with respect to higher education and to type of upper-secondary course are closely related is evident despite the fact that significant minorities of "vocational" students do in fact enter institutions of higher education and that a sixth of the General B students do not even take examinations. We have traced many of the ramifications of these interdependent decisions by analyzing first the associations between family background and types of courses in which youth enrolled, then going on to examine both overall and within-course-type patterns of association with the higher-education decision. By including classroom characteristics in some of the regressions, we were able also to identify in a first approximation the separate or marginal effects of peer association in the school environment on continuation into higher education. However, a number of awkward problems remain. One of these is the ambiguity in statistical interpretation of coefficients of determination and tests of significance when using a dichotomous dependent variable, as we did with EXAM. Another is the elusive question as to how far in fact the higher educational decision is determined by course of study in the secondary years, how far choice of course type reflects initial university intentions. In its very nature, this identification problem cannot be fully resolved, but we can at least gain increased understanding by

looking at the relationships by classroom units as well as by individuals as units of observation, and by comparing simultaneous-equation with single-equation estimates of key parameters.

Taking the sample population of a school as the unit of observation has some disadvantages. Among other things, it reduces degrees of freedom very substantially and precludes the distinction made earlier between effects of an individual's own background and effects of his class-room environment on his attitudes and behavior. However, use of groups as units of observation has the statistical advantage that we can simplify by substituting logit transforms of percentages for categorical independent variables; this makes it possible to experiment with simultaneous equation models that may be reasonably constructed to give determinate solutions. We avoid the statistical dilemmas that arise in use of a dichotomous dependent variable. There is also the satisfying fact that analysis of group parameters of behavior typically gives "better" results in the sense that much more of the observed variance will be "explained" -- as is very definitely the situation in the present case. This is to be expected since observations on groups smooth out the idiosyncratic or random factors that frequently play a very large part in the determination of individual acts or decisions. This indeed is one of the reasons we focussed on group-mean rather than individual earnings expectations as of the first interest in the preceding pages.

In the econometric analyses summarized here attention was concentrated on two main sets of relationships. (1) The first is the interplay between determinants of the socio-economic composition of a school's population on the one hand, the effects of that composition on proportions going on to university on the other. In this analysis the curriculum is treated as an exogenous variable, both drawing students of certain backgrounds and inclinations and then directing them increasingly toward or away from higher education. College intentions and student backgrounds are the endogenous variables of the model. The results of our explorations on this problem were quite satisfactory.

(2) Secondly, we treated curriculum and proportions going on to higher education as endogenously determined, with socio-economic composition as endogenous to the model. In this second case we were unable to obtain variables appropriately specified to deal with the relationships hypothesized, but a few words concerning our findings are of interest on other accounts.

Curriculum variable:

S... Estimated credits in language, mathematics and pure science, which are presumably most critical as preparation for university entrance examinations. It is hypothesized that the higher the value of S, the greater will be the proportion of students taking examinations. Values assigned to S by course type of the student were: General B, 75: General A, 55;

Technical, 48; Commerce, 54; Agriculture, 40. S varied among the General schools according to the proportion of students in the General B and General A streams or curricula.

Higher education variable:

Z... Logit transform of the percentage of students taking examinations for entry into institutions of higher education

Socio-economic background variables:

C... Logit transform of CLEDHI (the percentage of parents with college or university education)

Q... Logit transform of the percentage of parents in the top three occupational status categories (OSTAS 1, 2, 3.)

H... the sum (C + Q)

These three variables were treated initially as alternative measures. In the end the greatest use was made of H, which is unquestionably a better proxy variable for economic ability to pay than C or Q alone, and gives a broader index to socio-economic status. These are, of course, in part taste and information proxy measures.

Indicators of rurality, communications, and accessibility:

D... SLOW-50, described before and already used in numerous equations. Unfortunately, the implications of this measure shift drastically according to whether the dependent variable

is S or one of the other endogenous variables.

M . . . FREQ-M, also a variable used in a number of earlier equations. This variable is unambiguously an indicator (however imprecise) of information and perceived opportunity configurations relatively favorable to higher education when entered in equations with individuals as units of observation. A positive association with Z was anticipated.

K . . . A classroom rurality index. This is a modified logit transform of the percentage difference ($P_{ag} - P_{tec}$) where P_{ag} refers to the proportion of parents engaged in agricultural and related pursuits and P_{tec} refers to the proportion of parents who are technicians or skilled manual workers.

The zero-order matrix for these variables is shown in Table 4-26, and Table 4-27 gives the set of equations used in the first model, treating S as exogenous. Those equations are shown expressing the variables in standard deviation units to facilitate direct comparisons of coefficients across variables with quite different initial units of count and variances. The "intercept" is thus, automatically, zero. F values for the standardized beta coefficients are shown in parentheses.

Analysis Treating S as Exogenous

The structural equations (9. 1c) and (9. 1h) for C and H respectively were based on the a priori reasoning that children of better educated and

TABLE 4-26

ZERO-ORDER CORRELATION MATRIX; ASSOCIATIONS AMONG VARIABLES MEASURING CLASSROOM COMPOSITION, CURRICULUM, COLLEGE INTENTIONS, AND LOCATION

	Curriculum	Socio-economic Traits			Rurality and Metropolitanism			College Intent.
	S	C	Q	H	K	D	M	Z
S	—	.666	.663	.709	-.203	.046	.025	.813
C	.666	—	.758	.941	-.464	-.241	.219	.808
Q	.663	.758	—	.934	-.723	-.363	.327	.787
H	.709	.941	.934	—	-.629	-.320	.290	.851
K	-.203	-.464	-.723	-.629	—	.614	-.647	-.375
D	.046	-.241	-.363	-.320	.614	—	-.416	-.180
M	.025	.219	.327	.290	-.647	-.416	—	.145
Z	.813	.808	.787	.851	-.375	-.180	.145	—

TABLE 4-27

Equations for Analysis of Z, H and C
Treating S as Exogenous

Structural Equations

(9.1c) $C = .0923\,S + .7118\,Z - .1171\,D + u$
(0.45) (25.96) (2.07)
$R^2 = .665$ $F = 39.01$

(9.1h) $H = .1659\,S + .6790\,Z - .2057\,D + u$
(2.04) (33.17) (8.97)
$R^2 = .761$ $F = 62.72$

(9.2c) $C = .0852\,S + .6648\,Z - .1973\,K + u$
(0.44) (24.24) (6.05)
$R^2 = .685$ $F = 42.83$

(9.2h) $H = .1636\,S + .5755\,Z - .3802\,K + u$
(3.32) (36.84) (45.57)
$R^2 = .845$ $F = 107.07$

(10.1) $Z = .5012\,S + .4677\,C + .0301\,M + u$
(38.17) (31.66) (0.23)
$R^2 = .790$ $F = 73.92$

(10.2) $Z = .4118\,S + .5676\,H - .0294\,M + u$
(24.83) (43.26) (0.23)
$R^2 = .814$ $F = 85.89$

Reduced Form Equations

(11.1h) $H = .7182\,S - .2907\,D + .1503\,M + u$
(85.52) (11.59) (3.10)
$R^2 = .646$ $F = 35.84$

(11.1z) $Z = .8215\,S - .2007\,D + .0410\,M + u$
(136.81) (6.76) (0.28)
$R^2 = .710$ $F = 48.21$

(11.2c) $C = .5931\,S - .3630\,K - .0304\,M + u$
(43.97) (9.59) (0.07)
$R^2 = .557$ $F = 24.68$

(11.2h) $H = .5928\,S - .5686\,K - .0933\,M + u$
(79.65) (42.21) (1.19)
$R^2 = .753$ $F = 59.92$

(11.2z) $Z = .7660\,S - .2370\,K + .0273\,M + u$
(111.33) (6.20) (0.09)
$R^2 = .710$ $F = 36.10$

higher status parents would be drawn to and seek out not only academic courses but also schools reputed to send large proportions of their graduates on to university and/or that they would have advantages of entré into such schools. Hence both H and C should be positive functions of S and Z. H and C are negative functions of D for the simple reason that the base population of the more isolated communities (high values on D) has relatively few men with higher education or high status occupations. Even a greater relative selectivity into upper-secondary school in these areas is not sufficient to neutralize that factor. Equations (9.2c) and (9.2h) are similar to (9.1c) and (9.1h) except for the substitution of K for D. The fact that the variable K comes through much more strongly than D in these equations was to be expected; K generalizes a relationship that is at once both a community characteristic (related to D) and a school-specific variable that tends to take on its highest values in the agricultural schools.

In both the structural equations and the zero order relationships H is more closely associated with both K and D than is C. This reflects the fact that the strongest association between K and D on the one hand and any of the socio-economic status variables is with Q, which does more alone than in the combination measure with C. In association with Z, the two components of H are more complementary or mutually supportive in their impact.

The existence of an identification problem in the structural equations for C and H is obvious. A school large proportions of whose graduates normally continue into higher education may indeed attract relatively high proportions of high status youth; but it is also true that such youth in turn will tend collectively to sustain or raise the proportions of the school's graduates entering universities. Thus we have reversed the positions of Z and H (or C) in equations (10.1) and (10.2). Whereas S was relatively weak in the equations for C and H, in which it was swamped by Z, there is no comparable dominance by C or H when Z is taken as the dependent variable. This is consistent with what should be expected a priori, in view of the fact that S measures those very aspects of the upper-secondary curriculum that are most deliberately and overtly linked to examinations.[1]

Coefficients on M, relating to degree of Metropolitanism, fluctuated around zero, with the uninteresting exception of equation (11.1h). Indeed, no matter what other controls were included (or eliminated) in these regressions, neither D nor M nor those two variables in combination contributed significantly to the prediction of Z. (The best that we can say is that M does carry a positive sign in equations in which Z is the dependent variable

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[1] Examinations have been less narrowly academic than is commonly supposed, however. There are pressures in Japan at the present time toward tightening and narrowing the range of fields covered and their nature.

and H is not included; inclusion of H switches the coefficient on M from an insignificant positive to an insignificant negative value.) The weakness of M precluded the tests we had initially planned for single equation bias of coefficients on Z with C or H as the dependent variable, but these were not the most interesting or important coefficients. Fortunately we found ourselves in a good position with respect to tests for single equation biases in coefficients on C and on H in equations (10.1) and (10.2).

Taking relationships between H and Z and the equations using K rather than D as an example, it may help in understanding just what is involved to express it first in algebraic form (omitting the error terms).

From (9.2h) we have: $H = s_1 S + z_1 Z + k_1 K$

From (10.2) we have: $Z = s_2 S + h_2 H + m_2 M$

Solving these equations simultaneously gives:

$$H = \frac{s_1 + z_1 s_2}{1 - z_1 h_2} S + \frac{k_1}{1 - z_1 h_2} K + \frac{z_1 m_2}{1 - z_1 h_2} M$$

Let these complex coefficients be labeled to give $H = s_3 S + k_3 K + m_3 M$.

$$Z = \frac{s_2 + h_2 s_1}{1 - z_1 h_2} S + \frac{h_2 k_1}{1 - z_1 h_2} K + \frac{m_2}{1 - z_1 h_2} M$$

Let these coefficients be labeled to give $Z = s_4 S + k_4 K + m_4 M$. We now have the derived equalities:

$$z_1 = m_3 / m_4 \quad \text{and} \quad h_2 = k_4 / k_3$$

These values may be compared with results from the reduced form equations (11.2h) and (11.2z), which give direct estimates of m_3 and k_3 and of m_4 and k_4. However, the m coefficients were statistically insignificant throughout, which precludes inferring anything about single equation bias in z_1 from a comparison with the ratio of reduced-form coefficients m_3/m_4. On the other hand, the coefficient on K in the structural equation (9.2h) was highly significant. (In fact it is too high, as we shall see shortly, but let us set that aside for the moment.) Within the assumptions of the model we can then legitimately proceed to use this information to check for likely biases in the single equation estimate of the coefficient on H taking Z as the dependent variable -- i.e., in equation (10.2). We are in a position to do the same thing for the coefficient on C in equation (10.1) as well. Also open to us is the option of substituting equations using D for the reduced form equations using K in testing results on H. Always with Z as the dependent variable the results are as follows:

Single equation estimates (10.1) and (10.2)	$\beta_c = .468$	$\beta_h = .568$
Reduced form estimates in equations with K: (11.2c), (11.2h) with (11.2z)	$\beta_c^* = .653$	$\beta_h^* = .417$
Reduced from estimate in equations with D: (11.1c) with (11.1z)		$\beta_h^{**} = .687$

The single equation bias on C appears to be downward rather than upward, but as such adjustments go the contrast is not a substantial one. The first test, using the reduced form equations with K as an independent

variable, suggested an upward bias in single-equation estimates of the coefficient on H. However, there is an inherent simultaneity problem within the reduced-form equation (11.2h) in the relationship between H and K, and we have injected this distortion into the simultaneous equation estimate of the coefficient on H. Fortunately that problem does not arise between C and K. With respect to H we can get rid of it by using D instead of K in the reduced form equations. The result is the reduced form estimate β_h** = .687, which is higher than the single equation estimate of .568 (and virtually identical with the reduced-form estimate for C of β_c* .653). We remain with the same broad orders of magnitude so long as we do not inject K into the estimates for the coefficient on H.

Analysis Treating S as Endogenous

For the most part, in the short run S is quite properly treated as an exogenous variable. Youth select among schools according to course offerings; the schools do not change their character on account of their students. (Especially must this be the case for the public institutions, which constitute our sample.) However, an important qualification arises even in the short term because of the availability of General B and General A options in the same school and to some degree in pupil selections over successive years of study within those schools. Important also is the interaction between community characteristics and types of courses available. This is

properly reflected in our school samples for the rural areas of Japan in which we worked. However, our sample entails a decided over-representation of the vocational curricula in urban locations, and we have not weighted our observations in this set of regressions to correct for the initial stratification of the sample by school types. This creates an anomally in treatment of S as an endogenous variable. Our most serious problem,however, arises on a different count. With multiple caveats, then, let us see what we have.

Equation (12.1), in Table 4-28, explains S on the basis of the socio-economic character of the student population, proportions taking examinations for higher education, and degree of rural isolation or distance of the community from urban places. The significant positive coefficient on D reflects the fact that agricultural courses are almost the only non-general or vocational courses open to populations of distinctively rural and more isolated or distant areas. This points up the dilemma we faced in interpretation of the reduced form equations for analysis of relationships between S and Z. Equations (13.1) and (13.2) yield the patently absurd result of a negative reduced-form estimate of effects of S on Z. What is happening quite obviously is faulty specification of the model; D is serving as proxy for quite different aspects of remoteness when S is the dependent variable from what it represents when the dependent variable is C, H or Z.

TABLE 4-28

Equations for Analysis of S and Z
Treating H as Exogenous

Structural Equations

$$(10.2)\ Z = \underset{(24.82)}{.4118\ S} + \underset{(43.26)}{.5676\ H} - \underset{(0.23)}{.0294\ M} + u \qquad R^2 = .814 \quad F = 85.89$$

$$(12.1)\ S = \underset{(2.04)}{.2017\ H} + \underset{(25.32)}{.6838\ Z} + \underset{(9.61)}{.2336\ D} + u \qquad R^2 = .710 \quad F = 48.10$$

Reduced Form Equations

$$(13.1z)\ Z = \underset{(158.70)}{.8987\ H} - \underset{(1.30)}{.0846\ D} + \underset{(0.93)}{.0725\ M} + u \qquad R^2 = .739 \quad F = 55.80$$

$$(13.1s)\ S = \underset{(85.52)}{.8239\ H} + \underset{(8.12)}{.2673\ D} - \underset{(1.21)}{.1019\ M} + u \qquad R^2 = .594 \quad F = 28.72$$

Supplementary Independent Equations

$$(14.)\ Z = \underset{(23.67)}{.4311\ S} + \underset{(32.81)}{.5435\ H} - \underset{(0.41)}{.0407\ D} - \underset{(0.39)}{.0427\ M} + u \qquad R^2 = .815 \quad F = 63.86$$

By contrast, in all equations that included S among the independent variables to explain either H or Z the sign on D was negative, as we should predict. But geographic isolation is not an important factor in itself. Indeed, controlling for socio-economic characteristics of the school populations and the curricula pursued, geographic limitations on accessibility to higher education seem to have negligible effects on examination behavior. This is brought out again in the supplementary equation (14), which is simply equation (10.2) with the variable D added; even in an equation with M (which tends to make the sign on D more negative), the coefficient on D remains insignificant.

VII. Main Strands in the Analysis of the Higher Education Decision Reviewed

In this chapter basic decision models presented earlier, especially as formalized and partially operationalized in Chapter III, have been further elaborated and specified with respect to the higher education decision. It was hypothesized that youth seek entry to institutions of higher education according to their perceptions (and their parents' perceptions) of net benefits of such education with respect to career prospects. Those prospects are viewed in terms both of monetary rewards and of preferences relating to other aspects of career options associated with direct labor-market entry or higher education. Young people make this decision subject to

three main sorts of constraints: (a) individual ability or achievement levels in school, (b) economic ability to pay (in an imperfect capital market) for the financing of investments in one's self--even setting income effects on purchase of higher education as a luxury consumer good aside; and in some cases (c) claims of family enterprise on the youth's services, along with special opportunities such enterprise provides for him. Without further specification the third of these three sorts of constraints on choice could operate either to encourage or discourage a positive decision with respect to higher education. We have done no more than to open up this aspect of the decision nexus in the present chapter. The presumed effects of scholastic ability and of ability to pay are clear enough a priori so far as their direction is concerned. We hypothesized also that controlling for parental backgrounds, information concerning (and also, a different matter, perceptions of) the advantages of obtaining further education for future career prospects would be a positive function of degree of metropolitanism; the more metropolitan areas presumably make more visible both a wide range of career options and educational selectivity into those careers. Finally, we anticipated that experience in the upper-secondary schools, including not only school activities and training per se but also peer-group traits and increased knowledge of the adult world generally, would modify initial perceptions of college options and the subsequent implications of

the higher education decision. However, no explicit hypotheses concerning the nature or direction of shifts in perceptions or preferences was attempted. The findings concerning secondary-school course preferences initially and by hind sight discussed in Chapter III already had indicated that substantial shifts do in fact occur, and that they are especially important precisely where information is most limited and direction of endeavor least defined--i.e., among youth in the rural General A streams. Among the critical questions concerning the educational decision was indeed the extent to which Stage I and Stage II decisions were interconnected, the Stage II decision being anticipated at Stage I, or how far on the other hand Stage II was a second "genuine" or "crucial" decision point.

Each of these elements in our initial analytical framework and each of the problems to which we have just referred has recurred in varying forms and contexts. But no useful purpose could be served by a tedious repetition here of the findings in each phase of the multi-faceted analyses that have been undertaken in this long and complex chapter. Rather, we select out a few strands from that analysis as they may lead at once back toward earlier background factors and decision points and forward into post-school careers or, more precisely here, images and anticipations relating to those careers.

1. It is evident that in Japan the choice of an academic general as against any other upper-secondary curriculum is for most youth simul-

taneously a decision pro or con with respect to higher education, and is indeed so viewed. But this is not by any means the whole story. There are minorities of General B students who do not even take entry examinations for higher education, and there are non-academic general and vocational-school students who do go on to higher education. Typical proportions of youth taking examinations for higher education range between 10 and 20 percent in the student populations of vocational schools: the lowest proportions are the agricultural-course students (who have also the fewest hours in basic language, mathematics and science courses); the highest proportions are apt to be the commerce students, with the technical-school youth in between.

2. Agricultural and technical-school students planning on higher education are most often looking toward a continuation of specialization, but in greater depth and presumably with a strengthening of broad theoretical competencies to back up their expertise. Such commitments are especially clear among many of the technical-school students; the focussed determination of technical-school students seeking higher education is dramatically evidenced in the high proportions of these youth who state very definitely that they will take a year or more as rōnin if necessary to achieve their goals. This is not necessarily a matter of shifting perceptions; many of these college-oriented technical students had at least

junior college ambitions from the start, and actually tried to get into the five-year technical junior colleges. But there has also been a sorting out of ability within the technical streams, and youth who have been most successful there have set their sights on full university education. Because they have proven themselves in an upper-secondary education that had strong mathematical-theoretical underpinnings, they are also in most instances, ipso facto, happy with and oriented toward pursuit of higher technical studies. The survival and re-creation of technical education more in a German-French than an American pattern unquestionably contributes to the formation of this ambitious elite among the technical-school students. They have no real counterpart in the commerce or agricultural secondary schools.

3. High parental education and occupational status exercise significant effects on the likelihood of taking university examinations. This influence operates both via selection into the academic upper-secondary streams in the first place and subsequently whatever the secondary course taken. At an individual level the former is the more important influence, however. Further within-course effects of parental education operate mainly to distinguish sons from the least educated homes (with the smallest proportions taking university-entrance examinations) from all others. The non-academic General A students are a dramatic exception; parental education

differentiates among these youth very sharply with respect to their college orientations and examination behavior as they approach graduation. Within-course effects of father's occupational status are limited, though relationships are generally ordered in the expected direction among students in the vocational curricula; that is, the higher his father's occupational status the greater the likelihood that a youth will seek university education, the lower the father's occupational status the less the likelihood he will do so. No such monotonic relationship appears among the academic general students, however; indeed, the General B student from the most humble background is more, not less, likely to take examinations for university than a classmate whose father was a highly skilled manual worker or in the lower ranges of clerical employment. Sons of ordinary semi-skilled or unskilled workers who enter academic upper-secondary courses are a very select group of young men, both in their own ability and the extent to which, in one way or another, economic obstructions to the financing of education have already been overcome.

4. Among youth in the commerce, technical, and General A curricula, classroom composition has a highly significant effect on the likelihood of college attendance even after controlling for the student's own background. This relationship is especially strong among students in the commerce course, reflecting characteristics of these students,

their families and their expectations that will become clear only as we go further into career expectations and their correlates (in Chapter V). The analysis using schools as units of observation could not of course distinguish between the individual's background and the socio-economic character of the group as a whole. However, it did permit us to check in other ways on relationships among curriculum content, classroom socio-economic character, and proportions actively seeking higher education (as measured by the taking of examinations). "Curriculum" in this analysis was a cardinal measure of credits in language, mathematics and science. Using reduced-form equations, that analysis showed that controlling for curriculum there was no systematic upward bias in single-equation estimates of effects of classroom composition a as measured by parental education on proportions taking examinations; the identification problem in sorting out effects of parental background on university aspirations and the selection into college-preparatory schools of youth from better educated homes is resolved, if we can call it a resolution, in the conclusion that indeed it does work both ways, and independently as well as interactively. A parallel analysis using an index of class-room composition that included proportions of parents in the three occupational status categories gave essentially similar results. Given these findings the initial structural equations may be interpreted with somewhat more confidence, at least in the general orders of magnitude they suggest. Among other things, it is clear that (1) school curriculum explains very little about the backgrounds of students attracted to

a school once proportions of graduates taking examinations is included among the independent variables, but (2) both school curriculum and classroom composition come through strongly in the explanation of proportions taking examinations, with classroom composition in first place by a modest margin.

5. Empirically, the first effect of parental incomes is on whether young people attend upper-secondary school at all, and if so where. The very poorest youth are usually filtered out even before entry to any sort of upper secondary school; the most favorably situated financially are the most likely to find their way into a university-preparatory stream provided they have the wish to do so. A majority of the most favorably situated economically do seem to make the academic decision, anticipating the university option that will arise at Stage II. However, it is not at all clear how far this behavior is in fact a reflection of parental incomes and anticipated ability to pay for higher education, how far rather it may be a reflection of career perceptions that are associated with high parental education and occupational status. Economically advantaged students (taking relative parental incomes as the measure) are also found in significant numbers in the commercial courses, which send more of their graduates on to college than do any others except General B.

6. At the second stage parental incomes are again relevant both to whether a youth goes on with his education at all and to what sort of education he pursues, where. As Figure 4-1 showed, taking Japanese youth across the entire population of the relevant age cohorts, the crude zero-order relationship between family income and college attendance is exponential, with college proportions rising by progressively larger absolute percentages as we move arithmetically up the parental-income scale. These observations are of course compounded of economic selection processes prior to the university examination stage as well as at that decision point. Ability to pay factors go beyond this, however.

7. As we move up the family income scale--or from sons of men with low levels of education to those with higher levels, or from laborers' sons to those in higher occupational ranks, and so on--there is a consistently shifting distribution among institutions of higher education. Those whose parents had the lowest incomes, the least education, and the humblest occupations most often went directly to the labor market; next comes nightschool college and university courses (except in rural areas), then national and public colleges and universities, and finally the private colleges and universities. Among young people attending college or university, less than a fifth of those from the lowest income families attended private universities and less than a tenth attended the largely

female day junior colleges; among college youth whose parents had incomes of $2,500 a year or more, attendance at national universities was only double that for the lowest income group, whereas attendance at private universities had multiplied almost twenty times and young women were going in large numbers into the junior colleges.

8. Among the young men there can be no question but that as family incomes rise a number of factors combine to raise both rates of university attendance generally and attendance at private universities in particular. For one thing, the cost trade-off between higher money outlays for attendance at private institutions and time as rōnin in the attempt to gain entry to less expensive, heavily subsidized education in national and public institutions is altered. In addition, while high scholastic ability may be a necessary condition for securing economic assistance (directly or indirectly), less able youth with stronger economic backing can buy their way into college without facing severe academic competition. The interpersonal and related career-opportunity networks may also be quite different, especially when we contrast the business community and sons of successful smaller businessmen with the professions, government bureaucracies, and corporate bodies. And there can be no doubt but that the proportions of young people whose parents conceive continuation in school as primarily a consumer luxury and a

gentlemanly "finishing" activity rises at an increasing rate as family incomes begin to approach the upper decile.

9. On the negative side, youth whose fathers were deceased were the least likely to anticipate college attendance, especially among those in commerce and technical curricula. There is also some negative effect on university aspirations among agricultural students of residence in the more remote rural locations, which may be both a communication and information effect and a cost effect of relative inaccessibility to higher institutions. Conversely, the initial hypothesis concerning positive effects of metropolitanism on college orientation was confirmed exactly where it was appropriate: among students in the general courses.

10. In a very simple world in which "other things were equal" we could predict with reasonable assurance that the greater the difference between earnings anticipated with and those anticipated without higher education, the greater the likelihood that an individual would opt for entrance to university and would take examinations to that end. Indeed, we can apply this sort of reasoning in a very permissive decision model that gives wide scope for non-monetary preferences and for variations among individuals in those preferences. However, the various "other things," including inter-person differences both in non-monetary preferences and in real costs of further education, confound use of this

conventional and otherwise powerful as well as highly generalized economic decision model for the prediction of which individuals will and which will not elect to continue their education. The conventional model predicts only that if you increase the anticipated earning differential for a given individual you increase the likelihood that he will opt for higher education, and if you do this for an entire group of individuals you increase the proportion among that group who will make the college choice.

The tests we used in comparing groups of college-oriented with other students according to their perceptions of prospective earnings differentials between university and non-university men are not the same thing, but they do provide rough substitutes. Those substitutes constitute a strong test in that negative results could still be entirely consistent with conventional theory; they can negate only a rigid formulation that says the other things are either unimportant or invariant across the units of observation. It will be remembered that we used two indicators. One was the difference between projected incomes 20-30 years into the future if an individual received university education and if he did not. The other took those predictions and related them to perceptions of earnings that would be foregone while attending university.

The results supported the "economic" or investment decision hypothesis among students in the urban general streams; in every school

the anticipated differentials were greater among the students taking examinations than among those anticipating direct labor-market entry. On the average there was confirmation among the commerce students as well. Taking all students across courses but for the urban and the rural populations separately, again those anticipating college projected greater economic advantages of college education than did the non-college men; this was especially striking among rural youth. On the other hand, there was very little contrast between the responses of students taking examinations and those not taking them within the technical courses, in the urban agricultural schools, or in the rural general schools. Other factors predominated in sorting these students out between college and labor market, notably: financial constraints, inadequate performance as a scholar, and pressures to terminate schooling to participate immediately in family undertakings.

11. That multiple dimensions in career anticipations are involved in the college decision was clearly evidenced in a number of ways. It is no accident that sons of proprietors and managers were the most likely to attend private universities, and not solely on account of ability to pay. In equations taking anticipated incomes as the dependent variable, General A students are distinguished from all others in that the coefficient on EXAM was actually negative (though non-significant). First sons of

farmers typically attend agricultural courses whereas second sons enter the general courses, and next to students in agriculture it is those in the commerce curricula who most often said that they could not continue into higher education because of pressures to join in a family enterprise.

Peripheral evidence relating to career perceptions and investment choices comes also from what was no more than a fringe item in our interviews: responses concerning the use of hypothetical winnings in a lottery. These were presented in Table 4-13, dividing students into four categories by college plans; though the responses cannot of course be interpreted as predictors of what the youth would in fact do, they do serve well to suggest similarities and differences in important aspects of the ways in which investment and career options may be perceived. Particularly interesting may be the fact that among the students who wished but did not expect to attend university only 11 percent specified that they would devote their winnings to college expenses; these students were more inclined to buy land or put money in a savings account, and at least as inclined to specify its use for a business venture as to finance higher education. The finding that college intentions are positively associated with the status level of the occupation toward which the student aspired was to be expected almost tautologically, since the highest status occupations include those for which university education is a certification prerequisite.

But other dimensions of occupational choice do not have so obvious or consistent a relationship to educational plans. This chapter has already pointed to the relevance of two of these dimensions: (1) family or independent enterprise versus employee status and their ramifications, and (2) the distinctions among those with quite specific technical orientations (at whatever level), those with fairly clear career images in non-technical spheres, and those who have only the vaguest and most shifting perceptions of where they may be headed or might wish to go. The further exploration of configurations in occupational and earnings anticipations along with their relationship to actual Japanese occupational and labor market structures will be explored in the two following chapters.